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EDITORIAL

MILITARY PREPAREDNESS.

There has been considerable activity among medical men in the United States with a view to some organization for the proposed military preparedness. In each state committees have been created for the purpose of considering men and hospitals which might be available in time of war.

The movement has gotten considerable headway and has thus far reached the point of compiling lists of available men and hospitals. A classification of men has been made, with a view to the arrangement of units, which later may be grouped around possible base hospitals.

The government has been in touch with the whole movement and the reports by the state committees have been used by the central committee for the purpose of recommending available candidates for the Medical Reserve Corps of the Army. Already several examinations of such candidates have been had and more are projected by the Surgeon General of the Army, so as to bring the number and personnel of the Corps up to the standard desired.

It is anticipated that by the summer of the current year there will be enough men in the Medical Reserve Corps to arrange for summer camps of instruction, so that the members of the Corps may be made familiar with the duties of a medical officer of the Army.

The new organization of Officers' Reserve Corps to be developed from such material will be held available in time of emergency or of actual war.

It is highly commendable that so prompt a response has come from the medical profession and as the movement grows, more and more interest is bound to follow. It is especially characteristic of the medical profession to fall in line with any such demand upon their citizenship and it is also noteworthy that all of this has come about quietly and without ostentation, while the solons in Washington have as yet reached no sane basis for the organization of a general military service. At any rate, it looks as if the medical side of the military development will be well on the way to a solution before the United States Congress will have reached an intelligent basis for legislation regarding a military system.

In this line an important forward movement was initiated in Washington on January 6. The Secretary of War invited the Deans and Faculty representatives from the leading medical schools to meet in conference with the War Department to consider a plan of instruction of Senior medical students in military medicine and surgery.

The conference developed a schedule which is exceedingly comprehensive and will cover the study of army regulations, field service, military law, and the detail embracing also military surgery and hygiene as practised under conditions of military service in peace and in war.

While it is the desire of the War Department to have such instruction given in the medical schools, it is evidently the intention of the Department to provide the proper detail of army medical officers to give the instruction, which will consume regular scheduled hours in the Senior curriculum. The course will probably provide a period of practical instruction, after graduation, in summer camps, where the actual application of the lectures can be put into practise in the fields of tactics, conservancy, administration, discipline, etc.

This is quite in line with the military activity in the schools and colleges and if all the youth is to be encouraged to military enthusiasm by the systematic military phase in undergraduate college life, it is perfectly proper and timely that the medical schools should meet this effort of the War Department for a qualified Medical Corps.

There is an innate patriotism in all of us which needs very small encouragement to break into activity and the medical student will probably welcome this instruction.

The medical career of today and in the near future at best is not alluring and the amount of hard work essential to even mediocre success discounts the ultimate rewards. Any new field of activity for a large number of medical graduates should be welcome.

A recent writer* on the unpreparedness of the United States declares that "After all, what we really need is to recognize the advantages of universal military training" * * * "The truth is that universal military training in a democracy can be trusted not to lead to wars and quarrels with our neighbors, but on the contrary to develop self control and self respect, at the same time causing our neighbors to respect our opinions and the rights of our citizens."

We have already experimented with a voluntary military system which has proved an eminent failure. We are daily looking on at the cataclysm of European civilization and as yet with a complacence which is astounding. The wind, carrying disaster, may veer at any time and we are altogether unready. If the reflex of an energetic activity of the medical profession in all of its ramifications can start a popular en-

*Hiram Bingham in the **Yale Review** for July.

thusiasm, we should go on the way our leaders have begun and work all together to that end.

THE STANDARD OF THE STATE BOARD.

The Louisiana State Board of Medical Examiners at their last meeting in December promulgated the rule for a two years' college course for preliminary education to apply to all candidates for licensure beginning the study of medicine after January 1, 1918.

This is entirely consistent with the general policy of the Board for a number of years, meeting the higher standards of medical education as soon as they have been tried out. A number of states have already set that standard, either dictated by the medical school in the state university, or in the interest of medical education in the respective state. The action has not yet become general, but the Louisiana Board in joining the first dozen shows a proper regard for standards of medical education and supports the local Tulane School of Medicine, which in its current catalog announces a two years' college requirement after January 1, 1918.

The same rule comes up for action at the February meeting of the Association of American Medical Colleges, in Chicago, and it is expected to go into force for the colleges in membership.

With six years of college preparation and special medical education, the graduate hereafter should be at least scholastically equipped and the function of the State Board of Medical Examiners should consequently grow less irksome.

ACKNOWLEDGMENT OF THE NATIONAL MEDICAL EXAMINING BOARD.

The *Military Surgeon* editorially makes favorable comment on the results of the first examination of the National Board. The Secretary's report issued at the end of the year gives a very clear demonstration of the character of the examination and emphasizes the fact that the successful candidates deserved the certificate of the Board.

It is interesting to read the statement of the *Military Surgeon* that one of the licentiates of the National Board had been accepted by the Army Board, without further mental examination, which, in the light of the reputation of the Army Board for its severity, is as thorough an acknowledgement of the quality of the National Board's examination as could be presented. More than this, it is stated that the Mayo Foundation offered fellowships to the five successful candidates, a further voluntary acknowledgement of an educational standard which must go far in establishing the value of the National Board among the factors now potent for real standards.

The National Board proposes to hold a second examination in June and, with the experience of the first examination, there should be a large list of candidates, especially if such attractive opportunities as ready service in the Army or Navy and academic acknowledgment, such as that proposed by the Mayo Foundation, are held out to the successful examinees.

The laborious efforts of the members of the National Board have at any rate met with a prompt acknowledgment of service and the tokens thus far are of the highest order.

A NATIONAL LEPROSARIUM.

On January 25, the Senate voted for the Leprosarium bill, fathered by Senator Jas. E. Ransdell of Louisiana. To him is due the credit for this timely action by the national government.

With the Public Health Service in charge, and with $250,000 as an initial allowance, there should be no delay in establishing adequate accommodations for the lepers in the United States, probably totaling more than 1,000.

ORIGINAL ARTICLES

(No paper published or to be published in any other medical journal will be accepted for this department. All papers must be in the hands of the Editors on the tenth day of the month preceding that in which they are expected to appear. Reprints may be had at reasonable rates if a WRITTEN order for the same accompany the paper.)

NOTES ON MILITARY SURGERY FROM PERSONAL EXPERIENCES IN THE PRESENT EUROPEAN WAR.*

By K. WINFIELD NEY, M. D.

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During my five months' active service in the present European war, about one month was spent at the front, where I visited the First Aid and the Casualty Clearing stations in Northern France and Belgium. For four months I devoted my entire time as Surgeon-in-Chief of the Ninth Auxiliary of the French Red Cross, located at Cherbourg, which consisted of four base hospitals, including one military hospital. While I had considerable experience at the front with men recently wounded, my service at the base hospitals, which was far greater, left me to deal mostly with the after-effects of the more severe injuries, when they had been transferred to these hospitals.

I will try briefly to give you an idea as to the conditions at the front, in order that you may more readily understand the state of the injured when received at these hospitals, where the science of surgery strives to save that which the science of war has failed to destroy. Considering the immensity of this European conflict, in which all the achievements of modern science have been perverted to the destruction of human life—a war of high explosives, long-range guns and poisonous gases, conducted on the sea, under the sea, in the air and under the ground—one may readily understand that, from a military standpoint, it is vastly different from any previous war, both in character and magnitude; and just in the same manner it is different from a surgical standpoint.

In this war, the proportion of shell injuries to bullet wounds

*Read before the Orleans Parish Medical Society, December 9, 1916. [Received for Publication January 8, 1917.—Eds.]

by far exceeds that of any previous war; in fact, the great majority of casualties coming to the base hospitals were the severely lacerated wounds caused by shell fire, where the tissues lost all resmblance to human flesh and looked not unlike mud. This disorganized tissue could be cut away without causing pain or hemorrhage. Frequently these wounds destroy the entire thigh or shoulder, abdominal wall, perhaps both arms or legs, or the entire face.

The bullet wounds caused by rifle and machine gun fire, in my experience, were not so common as shell wounds. They were, as a rule, very severe, and differed from these injuries in other wars by the fact that the modern gun has a much greater muzzle velocity; and most of the wounds were received at short range—often less than 500 yards—and at such close proximity the bullet has an explosive effect, the point of entrance often being so small that it is difficult to find, though the point of exit may be as large as one's fist or even a child's head. When a missile of such high velocity strikes a bone, such as one of the long bones, the force is imparted to the shattered fragments, and they are driven deeply into the tissues in every direction.

Another feature which characterizes the wounds along the Anglo-French front is the severity of their infections. I have never in civil life observed wounds so intensely septic. This can be explained by the fact that in that country, which is thickly populated, the land has been heavily manured with the excrements of man and animal; it supports many cattle and is highly cultivated. The soil is kept quite moist with the frequent rains, so that the bacteria, with which the soil is laden, abound even to a great depth.

The underground warfare in trenches which has for a long time characterized the fighting in France is responsible for the insanitary conditions under which the men are compelled to live, and in which they are wounded. In wet weather the trenches are filled with mud, and often the men are compelled to stand in several inches or more of mud and water; in dry weather in just as much dust. The result is that their clothes are filthy when wounded; and since most of these wounds are from shrapnel, or from deflected and deformed bullets, they are badly lacerated, and the masses of dead tissue furnish ex-

cellent culture media for the micro-organisms which abound in the clothing, pieces of which are frequently carried to the depths of the wounds and there buried. Even the first-aid dressing is often applied in a dug-out by a comrade who is covered with mud or dust. Under such conditions, these severe infections are only to be expected.

But there is another element which has a certain amount of bearing on this question, and that is the state of the man's nervous system when he is wounded. At best, trench life can be described by two words, "Muck and Misery." Many of the soldiers are of the best French families; with sensitive nervous systems; who had never known hardship or toil; and are compelled to live in the trenches for weeks at a time, in mud and filth, without being able to bathe or change their clothing, until they are an offense to themselves and comrades—alive with vermin, suffering from intolerable itch, exposed to wind and cold, and almost daily rains, with but little protection and in constant danger of death by exploding shells, gas attacks, or mining operations, all of which are from an unseen enemy. When wounded, these men frequently fall into mud or water, often wait for hours before being moved or receiving first-aid attention, exposed to cold and wet, and sometimes suffering severe hemorrhage before assistance can be had from the regimental medical officer. I have had many of these men sent into the base hospitals of which I had charge wearing the same blood-stained, muddy clothing in which they were wounded several days before, and whose dressings, when removed, proved to be a regular poultice of pus so offensive that the odor seemed to permeate one's person for hours.

After they are wounded, the men are, as soon as possible (after receiving first-aid attention), transferred to a field hospital located at a convenient point a short distance back of the firing line, where they receive only the most urgent surgery. From there they are removed at once to the Casualty Clearing Station, which is a few miles farther back and more protected from the immediate danger of artillery fire. In the Casualty Clearing Stations the wounded may be permitted to rest for a few hours, or days if absolutely necessary, before being removed to the base hospitals, which removal may mean a journey

of days on slow trains, without adequate medical attention. In the Casualty Clearing Station one has to deal, to a great extent, with the important questions of shock and hemorrhage, and with those cases in which transportation is made impossible by the severity of the injury. Upon visiting the Casualty Clearing Stations one is struck by the absolute quietude of most of the men who have just been brought in. Their one desire seems to be to sleep and rest, and it is often with difficulty that they are persuaded to partake of hot stimulants. These men, with shattered nervous systems, are pictures of utter exhaustion.

In combating shock, pituitrin proved to be a valuable agent when the injuries were severe, and morphin was indispensable. When hemorrhage had been profuse, hypodermoclysis or infusion with normal salt solution containing a little adrenalin chloride gave most satisfactory results, and has been the means of saving thousands of lives.

It is here that wounds are usually superficially exposed and prophylactic antiseptics instituted with the hope of complete wound sterilization. Practically all agents which have been recommended in the advent of antiseptic surgery have been tried and found wanting. These wounds are infected from the beginning with dirt and dust and mud from the clothes and buried pieces of foreign bodies which have been carried to the depth of the wound and buried in the torn tissues and along muscular planes by the force of the projectile. The superficial apppearance of the wound is no indication as to its severity; for a very small opening in the skin may be only the external appearance of deep lacerations and great destruction of tissue. The essential treatment of all wounds in military surgery is free incision and adequate drainage from its most dependent portion. While not so imperative as drainage, the question of immobilization is an important one, even in the absence of fracture. Muscular action and movement of infected limbs seem greatly to disseminate the infection. Therefore, the three essentials in all wound treatments are free incision, adequate drainage and efficient immobilization.

Let it not be construed from the foregoing remarks that the prophylactic chemical sterilization of wounds is without effect and should not be attempted. I merely wish to imply that it is

far from being efficient; but its use is justifiable in that we know of nothing better. There is no doubt that it does kill a certain number of bacteria with which it comes in contact, but it certainly does not destroy those which have become imbedded in the tissues. As to what effect these chemicals may have with regard to the inhibition or stimulation of the natural protective elements remains to be determined.

The question of the treatment of infected wounds in military surgery naturally comes under two heads, that of prophylactic wound sterilization, which is done immediately at the front, and that of therapeutic sterlization, which is left to constitute much of the work at the base hospitals.

We know that, as a therapeutic measure, the use of antiseptics in the treatment of infected wounds has been only partially successful, and perhaps many of these wounds would have healed more kindly had the destructive chemical antiseptics been abandoned and the combat left entirely to the defending forces of natural resistance, assisted by such mechanical help as the surgeon might be able to give in the removal of foreign bodies, drainage and immobilization, with the support of the patient and the free use of sunlight and fresh air.

Wright has attempted to inhibit the growth of invading microorganisms by the use of the hypertonic salt solution, which is a 5% solution of sodium chloride, or by the use of salt tablets and salt packs, which are placed freely into all the recesses of the wound; the secretions of the wound, stimulated by the salt, effects its solution, which, acting as a lymphagogue, draws out from the infected tissues lymph which has spent all its antibacterial energy; and draws into the tissues from the bloodstream lymph inimical to microbic growth. It also inhibits coagulation, and so prevents the sealing up of the orifices through which lymph pours into the wound. It will also inhibit bacterial growth and assist in the disintegration of leucocytes with the formation of tryptic ferment, which has much to do with the digestion of necrosed tissue. I have often seen large, foul, sloughing wounds rapidly throw off the disorganized tissue and assume a healthy granulating appearance by this treatment. After granulation is well advanced, the hypertonic solution should be discontinued and the wound treated by the ordi-

nary methods. In this state of wound repair, the abundant pus (which is truly the "laudable pus" of the older surgeons) often contains but very little bacterial element, and frequently no pathogenic bacteria. When the wound assumes this aspect, it may be closed by suture, without fear. The essential is that in closing all dead spaces must be completely obliterated.

A method of treating wound infection with hypochlorous acid, as advocated by Dr. Alexis Carrel, promises to be most effective. Hypochlorous acid solution is easily prepared and very inexpensive, and in strength contains about 0.5% to 0.6% of hypochlorous acid or sodium hypochlorite. This is a powerful antiseptic and may be used in strength sufficient to kill most bacteria, without doing harm to the tissues. Carrel has, at times, varied the technic of his treatment and in his hands it has been most efficacious. However, the treatment requires considerable attention; but it bids fair to be the most successful therapeutic measure in the treatment of infected wounds. The wound is opened up to its depth. All foreign bodies and loose pieces of bone are removed. Numerous small drainage tubes are passed into all parts of the wound, and around them gauze is lightly packed. These tubes are connected above to a bottle or irrigator containing the solution, which is allowed to run frequently through these tubes into the depth of the wound, insuring a continuously fresh supply of the antiseptic. I might also say that the solution thus carried into the wound facilitates drainage. After the institution of this treatment, it is usual to find a great daily reduction in the bacterial count; and when the bacterial count is sufficiently low, and cultures are free of pathogenic organisms, the wound is safely sutured.

Dr. Carrel is using a modification of the original Dakin formula, which is made in the following manner:

To make 10 liters of the solution he weighs exactly 200 gm. of chlorinated lime (with 25% active chlorin by test); 100 gm. anhydrous sodium carbonate and 80 gm. bicarbonate. The 200 gm. chlorinated lime are placed in a 12-liter jar with 5 litres of ordinary mater, shaking the whole thoroughly two or three times and setting it aside over night. In another jar the sodium carbonate and bicarbonate are dissolved cold in 5 other liters of water, and then the contents of this jar are

poured at one gush into the jar containing the maceration of chlorinated lime. The whole is vigorously agitated for one minute and then set aside for the carbonate to settle. After half an hour, the clear liquid is siphoned off and filtered through two layers of paper. The liquid fluid thus obtained is then ready for use. It is kept in a cool place, sheltered from the light. It should contain from 0.45 to 5% sodium hypochlorite, with small amounts of neutral sodium salts. The solution is isotonic to the blood serum. The boric acid of Dakin's original solution has been dropped.

How shall we eventually effect the sterilization of wounds, or prevent their infection, has yet to be determined. Certainly, it rests, in great part, with the bacteriologists—whether it be by immunizing with vaccins, as we do in tetanus or typhoid, or by some other physiological process.

Salt tablets and packs placed in the cavity of wounds, at the front, seem greatly to inhibit the bacterial growth, and the salt thus used, being slowly dissolved, has a more lasting effect, which is of great importance in that the wounds may not be dressed for several days during transportation to the base hospital.

I found wounds treated by Wright's method to be always in better condition upon arrival at the base than those treated by any other method.

I wish to say here a word about the too frequent dressing of wounds after granulation has become established and the temperature normal. It has been my experience that whenever these dressings were changed the traumatism inflicted produced only bad results, inasmuch as there was usually a rise in temperature. So long as the dressings remained undisturbed, even though saturated with pus, the temperature ran its normal course; so I made it a rule in my work to change the superficial dressings when it became necessary, but the gauze in immediate contact with the granulating surface was left undisturbed.

Much has been written regarding the use of antiseptic paste as a first-aid treatment of wounds. It was advocated and used early in the war. It is true that its use probably prevents contamination from without, but it does not sterilize the depths of

the wound. It is unscientific from the surgical standpoint in that it trangresses one of the most vital rules of surgery—that of the drainage of wounds.

In septic wounds, recovery was common without symptoms more severe than should be anticipated from the traumatism present; but in certain other cases pathological complications developed, such as gas gangrene, septicemia, etc., without adequate traumatic cause; and in other wounds healing was unduly delayed, sinuses persisted, and often the patient would drift into an asthenic state or a prolonged convalescence, this indicating the invasion of bacteria through a break in the defensive mechanism of the body, or perhaps to the lowering of the powers of resistance through the absorption of the products of putrefaction or toxins.

Treatment of Gun-Shot Fractures.

About 20% of the cases received at the base hospital were gun-shot fractures of the leg, many of which were a most severe type, presenting great destruction of soft parts and bone, with a degree of sepsis endangering both life and limb. These cases were, as a rule, most difficult to handle and often taxed the resources of the surgeon to the utmost, as it was necessary to secure immobilization, because of the great pain caused by the slightest movement; and at the same time to maintain continued extension with all the joints in a position of semiflection, with provision made for frequent dressings, or the adoption of continuous irrigation. This was accomplished by means of an elevated wooden trough splint, the trough of which was made in sectional panels, which could be removed in whole or in part for the purpose of dressing. I also found the sling splint, made of a heavy wire frame, to be of great service, as it was essential that the apparatus be sufficiently simple to permit dressings being made by nurses—the assistant surgeons usually had very little time to make such dressing.

As in all septic wounds, these cases demanded free opening, that they might be efficiently drained. Longitudinal incisions in the leg for drainage often proved failures, because the tension of muscles and fascia tended to close the incision; so that in such cases transvere incision was usually necessary, as the muscular retraction leaves a wound whose lips gape widely. Good

drainage, and that in the most dependent position, is certainly the most important factor in the treatment of all these wounds.

Mechanical fixation by wires and plates in compound fractures is very advantageous, as union is more certain when shattered pieces are held together, and the immobilization is more perfect. This should be the rule, providing the general condition of the patient and the condition of the wound will permit such treatment. Contrary to the generally conceded rule that the wiring and plating of bones in septic wounds is very dangerous, owing to the possibility of generalized infection, I found that patients so treated suffered no ill-effects and had better functional and anatomical results, with a shorter convalscence, than those more conreservatively treated. The danger to the patient in mechanical fixation of infected fractured bones certainly has not been substantiated in my experience, nor have I ever had cause to regret its use.

Approximately one-half of the work at the base hospitals consists of removing from bones sequestra and foreign bodies, which are responsible for persistent dicharging sinuses. The treatment of chronic bone suppurations was often a difficult question. In spite of all that one might do, sinuses seemed to persist. In more than one hundred cases I used Beck's Bismuth Paste, with a percentage of cures less than 2%. There seemed to be no form of treatment other than radical surgery, which would suffice to cure this persistent suppuration. Many of these cases, when opened, would present large bone cavities, filled with necrosed and granulating tissue, with numerous sequestra. Simple curettage of sinuses and cavities, without complete removal of the walls, were, as a rule, fruitless, so far as closure was concerned. The only satisfactory treatment consisted in the complete removal of the walls and scar tissue, and in filling in the bone cavity (which is made as shallow as possible by cutting down the walls) with flaps of muscular tissue, sutured in place. I repeatedly tried complete closure of these wounds after such treatment, and with disinfection of the tissues with iodin and other antiseptics; but in every case such alarming symptoms developed in regard to pain and high temperature, within twenty-four hours, that I was always compelled to reopen and use drainage.

Infected wounds in soft tissues may be completely excised and sutured, but when bony tissue is involved this procedure seems impossible.

Another part in bone surgery which was forced most emphatically upon my attention was the recrudescence of local infection in completely healed wounds. In numerous cases, after a surgical intervention, even though the incision were placed far from the original wound, the old scars would break down and suppurate freely. This occurs even in compound fractures and fractures involving joints, after passive motion or some slight traumatism. I have seen the temperature rise to 105 degrees by the patient simply bumping his leg against the bed, and in two days drop to normal, only to repeat the above upon slight traumatism. Such cases always demand free incision and drainage. The case referred to had been completely cicatrized for more than three months, and upon opening, a large bone cavity was found filled with necrosed tissue. This recrudescence of local sepis was, perhaps, our one greatest hindrance in the correction of deformities, and I early made it a rule never to do any plastic operation or make bone grafts for ununited fractures until the wound had been healed for at least three months. Later, I extended this time to six months.

Extraction of Foreign Bodies.

The localization and extraction of foreign bodies is forced into prominence in military surgery. The use of the X-ray in this field is as indispensable as it is in the treatment of fractures. Foreign bodies of metallic nature being so accurately located that their extraction proved, in most cases, to be the least difficult part of my work. It has always been a question—and one very much discussed—as to the indications for removing a foreign body from a healed wound which is apparently causing no damage. It is always indicated in infected wounds, or sinuses, which often heal very kindly after extraction; but when a wound has completely cicatrized, and the location of the foreign body not such as to produce symptoms, it may remain with immunity. However, the mental condition of the patient frequently is such that the surgeon is compelled to remove perfectly harmless pieces of shell or rifle ball.

> "A man in the trenches can never understand that a piece of shell in his leg is anything but an unmixed evil. He ponders, he worries, and ultimately it becomes a source of irritation to him. It may cause him real pain, or it may be imaginary, or assumed; but, in any case, it interferes with the proper discharge of his duties."

Frequently wounds, completely cicatrized, become inflamed, cause pain and produce a rise in temperature for a few days, then subside, until some active exercise again produces trouble. In such cases I always opened up the old scar and would often often find a foreign body, such as a piece of clothing, not shown by the X-rays. If I failed to find anything I simply drained and used hot fomentations and usually was rewarded with the discharge of some foreign material.

Acute Gas Gangrene.

Acute emphysematous gangrene is one of the most important incidents among the wounded. Early in the war its presence was an indication for immediate amputation high above the infected area. In these amputations the mortality was extremely high. A more conservative treatment—and I think one which is very much better—is the use of peroxid of hydrogen, with which the tissues are infiltrated above the lesion. Our technic was the making of many small incisions, about three inches above the line of advancing gangrene, through which a pair of artery forceps were thrust and widely opened, separating the subcutaneous tissue and muscular planes. Through these openings the nozzle of a large syringe was introduced and neutral hydrogen peroxid (10 vols.) at body temperature was forced into the tissues under pressure and massage. This was repeated all around the limb, forming a complete belt of oxygen above the gangrene. The wound was then explored, removing all foreign bodies and necrosed tissue, cleansed with hydrogen peroxid, and the limb was dressed with dry gauze and cotton. The shock, after this procedure, is usually marked and morphin should be freely used. The oxygen which is evolved from the peroxid greatly distends the limb, but usually there is an arrest of the infection.

Tetanus.

Tetanus was very prevalent early in the war, but at the present time it is rather uncommon. This is due to the fact that

all wounded men are immediately given a prophylactic dose of tetanus antitoxin. The man is marked with the letter "T" upon his chest, which indicates that he has received this treatment. If, however, there exists any doubt about him having had this treatment, for fear of antiphylaxis, he is given only a half dose. The prophylactic use of antitetanic serum has certainly saved thousands of lives, and it alone is responsible for the greatly diminished number of tetanus cases now seen in the hospitals. This is but another example of that most useful and important branch of our profession—preventative medicine—which has practically eliminated typhoid and has, perhaps, saved more lives than the whole science of war will destroy.

Injuries To the Nervous System.

Gun-shot wounds of the head were greatly reduced (probably as much as 50%) by the use of a steel helmet which was adopted by the French early in 1915; but, in spite of this, wounds of the head were quite common, due to the fact that in the trenches the head is, perhaps, the most exposed portion of the body. The treatment of skull wounds would really demand a paper of itself, but time forbids that I give more than a glance at this important subject. It is exceedingly difficult to differentiate between scalp and skull wounds, and many cases having the external appearance of simple scalp wounds proved later to be associated with deep wounds of the skull and brain. It is important that all such cases be carefully explored and the slightest indication of intra-cranial pressure demands the making of a large osteoplastis flap of the skull for the purpose of cerebral examination and drainage. The importance of a large opening I cannot too greatly emphasize. Chronic and acute suppurative diseases of the middle ear are prevalent, and more than one-half of the men sent in to the base hospitals suffer from ruptured eardrums, due to the bursting of the large shells. These cases are usually infected, and not a few of them develop brain abscesses as a complication.

Injuries to nerves were relatively common. Both complete division of nerve trunks and inhibition of function, due to contraction of scar tissue, were frequently met. On two occasions I did nerve suture, where all the branches of the brachial plexus

had been severed. Nerve injuries were most common in the upper extremity. The median and ulnar were very prevalent Contraction of scar tissue about the nerves, producing paralysis, was very amenable to treatment. A few days after operation the paralysis would begin to disappear. The operation consisted simply of freeing the nerve of scar tissue and changing its bed by burying it in an adjacent muscle to prevent further formation of scar tissue. In the surgery of nerves I frequently found it difficult to discriminate between healthy nerve and scar tissue; but found that by injecting the nerve with saline solution and ballooning it, as it were, the presence of bands of scar tissue could be readily determined. This proved most helpful in making sections of nerve ends for suture.

In this paper I will not take up the subject of gunshot wounds of the abdomen, but it will suffice to say that if the condition of the patient will permit and the operative facilities are adequate, the abdomen should always be explored.

Many of the cases that are sent to the base hospitals come there with a diagnosis of "general fatigue and tachycardia." These are sent in by the hundreds, and in many instances absolute rest in bed and digitalis failed to cause abatement of the symptoms. These men could stand no exertion, and even at rest the heart action was very rapid. I observed a number of which who had remained in hospitals for months, during which time they developed a gradual enlargement of the thyroid gland. In quite a few of these cases they were relived only after I had ligated one or more thyroidal vessels or removed a lobe of the thyroid gland. These cases, I believe, indicated the derangements of the ductless glands due to emotions.

Certainly, after this war, Europe will be full of deformed men. What the result will be of such shocks to the nervous system is hard to determine and sometimes we are almost afraid to think. The great bulk of the work, after all, is falling upon our profession, and will continue to do so in this great struggle, in which are arrayed man against man on the one hand, and surgical science against death, mutilation and disease on the other.

PROCEEDINGS OF THE AMERICAN SOCIETY OF TROPICAL MEDICINE.

DIAGNOSIS OF "THREE-DAYS FEVER."*

By DR. GEORGE C. SHATTUCK, Boston, Mass.

This paper is based on clinical observations made at the Paget Hospital, near Skoplje, Serbia, in the months of June and July, 1915. During these months the epidemic of typhus which had prevailed then was coming to a close, and mild or atypical typhus, therefore, were to be expected.

Diagnosis in such cases is most difficult, nor do I see how it can be made with certainty in the absence of a reasonably characteristic eruption. At the beginning of the recent European epidemic of typhus, German physicians working in prison camps met with a large number of cases of illness resembling influenza. Their experience has important bearing in the subject of diagnosis. Wiener observed that 10 to 14 days before the development of typhus in many individuals there was headache, malaise, nasal catarrh, cough, and sometimes angina, which disappeared in from 3 to 5 days. There being no reason to believe that the prodromal symptoms of typhus appear so long in advance and disappear again before the true onset of the disease, the conclusion seems inevitable that some other infection preceded that of typhus in those cases.

This infection may have been influenza.

Siebert's experience was different. He observed at first mild influenza-like illnesses, followed by other cases of definite typhus which became more and more severe. He had the impression that among the early influenza-like cases there were some of abortive typhus, and that similar cases occurred also later in the epidemic. He thinks that mild cases of typhus *without* a *rash* may run a course suggesting influenza.

These writers saw "influenza-like" illness, either preceding the development of typhus in cases of individuals, or appearing before the epidemic, or among the earliest cases of recogniz-

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able typhus, but there is no satisfactory method of differentiating mild or abortive typhus from influenza.

If this difficulty exists at the beginning of an epidemic it is likely to recur at the end, when mild and atypical forms of typhus are again to be looked for. Conjunctival injection and other symptoms and signs common in influenza are common also in mild typhus.

The leucocytosis of typhus is often lacking, and probably most unreliable for diagnosis in mild cases.

Another fact of importance is that toward the close of the typhus epidemic several of our patients with typhus had severe bronchitis with purulent sputum in which influenza-like bacilli were stained.

At the same time there developed among the orderlies and others about the hospital many cases of fever lasting three days, more or less, and characterized by conjunctival injection, catarrh, reddening and slight swelling of the tonsils, frontal headache, drowsiness, loss of appetite, malaise with more or less pain and absence of eruption.

Most of the persons in question were immune to typhus, having had it a few months before. Therefore, if the early history of the epidemic and the sputum findings in some of our cases be regarded as evidence that influenza was about, the conclusion follows that the transient fever was due to influenza in a mild form.

But some cases otherwise similar showed a slight rash which faded without becoming petechial, and this group of cases was regarded as representing abortive typhus, so that it is altogether probable that some of these cases may have been abortive without a rash if typhus can occur without a rash.

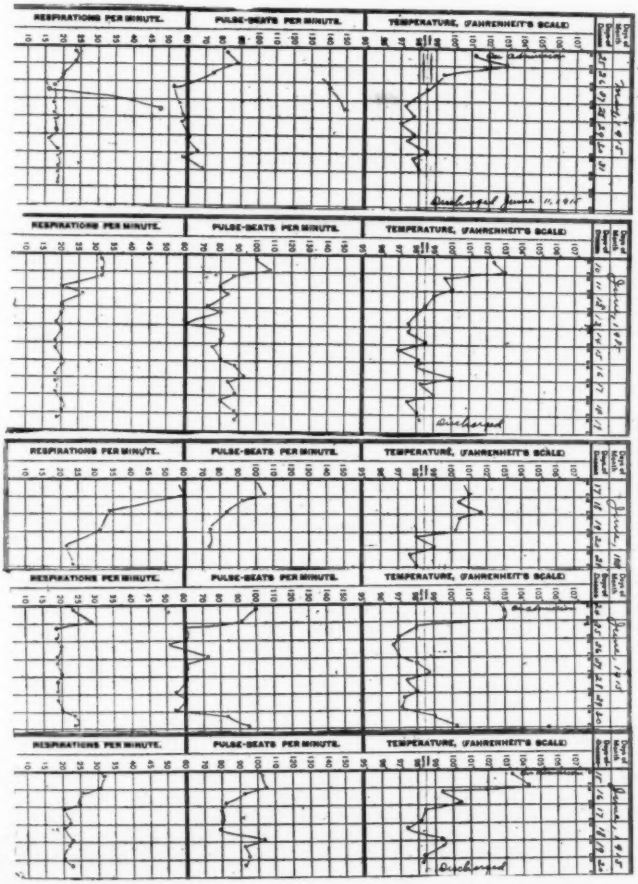
At about this time Dr. Castellani visited the Paget Hospital and said that he believed he had seen many cases of pappataci fever in the town where he worked at another hospital and was running a dispensary.

The question at once arose whether the influenza-like cases in persons immune to typhus might really be cases of pappataci fever.

This view was subsequently strengthened in my mind by several cases of fever among members of our Sanitary Com-

mission, in which the symptoms were strikingly alike and in which no eruption occurred.

From recent literature on the subject of pappataci or sand-fly fever, it appears that the duration of the fever varies from 1 to 5, and perhaps to 7 days; that there is usually a leucopenia with decrease of the polymorphonuclear cells, and that the pulse rate seldom exceeds 80, even with temperatures of 103°. Unfortunately, no white-counts or differential counts were made in the cases which I saw. If the pulse was slow in any of them the fact was not observed, and in the charts of illustrative cases appended the pulse followed the temperature.



The onset of pappataci fever, according to Birt, is sudden, with chilliness, nausea, headache, heaviness and discomfort about the eyes, lumbar pain and stiffness of the muscles of the legs, and somnolence. On the next day there is fever of 101 to 102°. The face is flushed, the conjunctivæ injected, the tongue coated, and there is stiffness and pain in the back and calves of the legs, but no rash. The patient complains of frontal headache and is mentally depressed. The leucopenia is slight. The average white count in 35 of Birt's cases was 5,428, and the differential counts generally showed about 56% of polymorphonuclear cells.

Taylor and Kahn emphasize the fact that pappataci patients complain of pain, but that in malaria the complaint is of fever. They found the fauces injected and the soft palate red.

The diagnosis of pappataci depends on presence of the usual signs and symptoms, the existence of other cases, the occurrence in summer in a region where the sand-fly is found, and the exclusion of other diseases by examination of blood-films, negative serum reactions and sterile blood cultures.

My data is insufficient for a positive diagnosis, but the fact that Doerr and others have studied epidemics of pappataci fever among soldiers in Bosnia and Herzegovina, points to the conclusion that it probably exists also in Serbia.

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Series No. 88. Patient of Writer.

Diagnosis. Abortive Typhus (?).

Clinical Notes:

May 26:. Sick 2 days. Complains of pain in temple, thighs and back.

Physical Examination: Rather drowsy, but mentally clear and alert when aroused. Pupils equal and of moderate size. Conjunctivæ moderately injected. Tongue: thin white coat. Throat: soft palate, pillars of fauces and pharynx red. No spots on the mucous membranes.

Heart negative. Pulse of good quality. Blood pressure 90S-60D. Hemoglobin 80%.

Lungs and **Abdomen** negative. Splenic dulness not increased. Spleen not felt.

Knee jerks present. No stiffness of neck or legs. Thigh muscles slightly sensitive on firm pressure.

Skin: Face covered with a red flush which extends two-thirds of the way down the neck and in front covers a V-shaped area extending onto the sternum. Ears very red. A slight flush extends over the lower part of the neck to shoulders and over the clavicles to the second ribs where it gives place to rose-colored macules.

On sides of chest, flanks and abdomen are a few bright red, clearly defined spots the size of a pin head and a few purplish spots of about the same size which do not disappear on pressure.

On the inner aspects of the arms and of the flanks the **taches bleuatres** are numerous. In the center of some of these is a bright red circumscribed spot like those already described on the sides of the chest and flanks. These spots are believed to have been caused by bites.

On the hips and on the backs of the hands are a considerable number of maculo-papules some of which are capped by a small vesicle. The nature of these spots is uncertain. They resemble acne more than anything else.

June 2. On the day after entrance the temperature dropped to normal. On the same day a rash consisting of groups of very small, irregular papules was found on the flanks and sides in the morning. In the afternoon it had nearly disappeared and in the evening there was no sign of it. Patient's condition today is excellent.

June 11. With the exception of a rise of temperature to 99 degrees on one day, there has been no fever since the temperature dropped. Patient to be discharged to-morrow.

Series No. 91.

Entered June 10. Abortive typhus?

Clinical Notes: June 10. Had been ill for three days and complained of pain in the forehead and arms. Age 27.

Physical Examination—Skin: Cheeks to temples much flushed, ears red, nose slightly so. Forehead and chin pale. Face not tanned. Complexion light. On shoulders, front and back, and on upper chest rose-pink macules and a very few maculo-papules which disappear on pressure. Few on upper arms. Lower arms, sides of chest, and abdomen show no spots of this kind. Few spots on chest and abdomen due to bites. On the legs are many excoriated papules. No characteristic spots. Feet: few spots of doubtful nature. Lower back the same. Pupils equal and react to light. Conjunctivæ not injected. Teeth good. Tongue clean. Throat red.

Heart action regular. Second sounds accentuated. Aortic louder than pulmonic. First sound clear. Pulse of good volume and

tension. Heart dulness normal. Blood-pressure 125S-60D. Hemoglobin 95%.

Lungs: few musical rales.

Abdomen: full and soft; tympanitic.

Liver not felt. Spleen not felt. Splenic dulness not increased. No stiffness or sensitiveness of neck or legs. Knee jerks present.

June 12 Patient ate a large quantity of cherries yesterday, but is none the worse. Spots fading rapidly and no new ones coming. Temperature almost normal.

Series No. 97. Patient of Dr. Smith.

Diagnosis: Pappataci Fever (?).

Clinical Notes: June 17 patient entered. Age 22. Complaining of pain in head and neck and said he had been sick one day.

Physical Examination. June 18. Face including forehead flushed as in typhus. Conjunctivæ markedly injected. Tongue coated. No eruption. Examination otherwise negative.

Diagnosis: Typhus (?).

June 22. Flush slight. Conjunctivæ still slightly injected.

Diagnosis: Influenza?

Series No. 102.

Diagnosis: Pappataci Fever (?).

Clinical Notes: Admitted June 24. Age 30.

Present Illness: Sick for three days before admission. Complains of headache.

Physical Examination: Face flushed. Conjunctivæ injected. Tongue clean. Examination otherwise negative. Spleen not felt. Neck not stiff. Legs slightly so.

Series No. 103.

Diagnosis: Pappataci Fever (?).

Clinical Notes: Entered June 15. Age 27.

Present Illness. Ill for one day.

Physical Examination: Conjunctivæ slightly injected. Abdomen somewhat distended. Legs slightly stiff. Otherwise negative.

THE EPIDEMIC OF DENGUE IN PORTO RICO; 1915.*

By DR. W. W. KING,

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(From the Institute of Tropical Medicine and Hygiene of Porto Rico.)

I am inclined to give the following account of the recent outbreak of dengue in Porto Rico not only for whatever medical interest there may be in the subject, but also because of the erroneous articles which appeared in the press of the United

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States as to the nature and the extent of the epidemic, crediting dengue,, a disease very exceptionally fatal, with 80% mortality and making other equally absurd statements, sometimes apparently backed by the authority of members of the medical profession. It is charitable to believe that they were misquoted.

There has been some discussion among physicians in Porto Rico whether the disease in this instance was a recent importation or of local origin, and in this connection it is interesting to note that Bermuda and Havana reported epidemics of the same disease about the same time. From the nature and circumstances of the communication with these places and the previous presence of the disease in San Juan, Porto Rico, it hardly seems probable that it was imported, but far more likely to have started locally. Dengue is apparently endemic in Porto Rico and has at times assumed more or less epidemic prevalence without having much attention paid to it. This time it attracted widespread notice not only in Porto Rico but in the United States and foreign countries, due to its having been miscalled and persistently reported as yellow fever by the surgeon of the army post, and due to the number and prominence of some of its victims. Various lines of buisness narrowly escaped serious harm, foreign governments threatened quarantine against Porto Rico and in one instance did require precautionary measures to be taken.

That dengue is endemic in Porto Rico seems evident, although certain years few or no cases may be seen. No records or statistics are available, as it has not been a reportable disease until recently, and then only a small percentage of the cases have been reported. However, prominent physicians have told me that they have been accustomed to see dengue cases from time to time, and my experience is in accord with their statements. During a tour of duty in Porto Rico from 1900 to 1906, I occasionally saw such cases, and distinctly remember that at one time they were unusually prevalent in San Juan. Since returning to Porto Rico in 1913 I have treated several cases and have known of others occurring in the practice of my professional friends. Personally, I suffered a severe attack in May, 1915; yet there was no undue prevalence of the disease in San Juan at that time nor up to the time of my temporary departure at

the end of August, 1915. Returning in October, I learned of an unusual number of fever cases in San Juan; that certain of them had been reported as yellow fever, and that this had been officially denied by the Board of Health, which had stated that the so-called yellow fever cases were various diseases, including dengue.

Yellow fever had not been reported in Porto Rico during the seventeen years of the American occupation and, if it had appeared, it was important to me, as chief quarantine officer of Porto Rico, to know it at once and to determine, if possible, how it had entered the island. Furthermore, I was requested by the Governor of Porto Rico to make an independent investigation of the situation for him. Under these circumstances, I endeavored to make as thorough inquiry as time and circumstances permitted. Thanks to the kindness of several physicians, I had exceptional opportunities of seeing or getting notes on a varied assortment of cases of fever in addition to those that came under my personal care. Fevers due to malaria, gastro-enteritis, typhoid, etc., did not seem to be more common than normally, but it was soon clear that we were dealing with epidemic dengue, as evidenced by the frequent occurrence of typical and atypical cases, not infrequently reported under various diagnosis, such as yellow fever, three-day fever, seven-day fever, pappataci fever, malaria, gastric fever, biliary fever, etc. Surgeon General Gorgas, United States Army; Assistant Surgeon General Carter, United States Public Health Service, and Dr. Mario Lebredo of Havana confirmed my report of failure to find yellow fever, and they did find dengue. Pappataci fever has never been reported in Porto Rico, and the analysis of cases reported as such during this epidemic did not bear out diagnosis. Some of them did show a three-day fever, as dengue sometimes does, but others ran a longer pyrexia and did not differ in any important detail from others outside this particular clientele. The chief differential point in the diagnosis of pappataci fever in these cases was slow pulse, which is a frequent symptom in dengue also. The diagnosis of dengue was based upon the following principal symptoms: Rapid onset; febrile paroxysm lasting from five to seven days, accompanied by characteristic pains, leucopenia, lymphocytosis, and followed by the rash;

absence of jaundice, albuminuria, and important respiratory and digestive symptoms. A discussion of the types of the disease and its clinical aspects as I saw them are reported in a separate paper, "Clinical Types of Dengue in the Porto Rico Epidemic of 1915."

Judging from the information which I was able to obtain, the outbreak began about the middle of September, 1915, and rapidly attacked a considerable percentage of the inhabitants of San Juan and its suburbs, Puerta de Tierra and Santurce. The disease spread to the towns of Rio Piedras, a few miles inland, Cataño, across the bay, both in intimate communication with San Juan, but the number of cases in each was proportionately much less than in San Juan. Information in regard to other localities on the island was very inadequate and inaccurate. From some towns some increase in fever cases was reported, shown by the microscope to be malarial. From one other, I received the very suggestive statement of the existence of malarial cases in which the malarial organism could not be found but that quinin caused disappearance of the fever in a few days. Of special significance was the statement that the *quinin often caused a rash.* These cases were probably dengue. In some communities, certain physicians with knowledge of the outbreak in San Juan kept sharp lookout for the disease and have assured me that there were no cases in their localities. Rural dwellers apparently escaped except when they contracted the disease in the city. It may be said from what data were obtainable that the disease in epidemic form was confined practically to San Juan.

The topography, etc., of San Juan may be of interest. The city proper lies at the western end of a rocky island approximately three by one-half miles. It is compactly built, with very few open spaces except streets, and with little vegetation. Houses are built Spanish style in solid blocks, with interior courtyards stone or cement paved. There is excellent natural drainage and good sewerage. Streets are well paved with brick or asphalt, and well kept. This portion of the city, about one mile in length, has the ocean on the north, the bay to the west and south. To the eastward runs the main highway leading to the mainland.

About one-quarter of a mile along this highway, still on the small island, begins the suburb, Puerta de Tierra. It is an ex-

tensive collection of small separate houses occupying a narrow strip of about one mile of low land between the road and the bay. It is inhabited chiefly by working people. Approximately one-half mile further eastward, across mangrove swamps and a channel connecting the ocean and bay, begins the suburb of Santurce, a residence district of all classes according to the section. It occupies a broad sandy ridge well elevated and well drained in the central part but with other portions low and poorly drained. It is roughly about three miles long by one mile wide. Houses are usually surrounded by yards with abundant vegetation of different kinds. The estimated population of these three divisions of San Juan is 20,542, 10,836 and 17,338, respectively.

Starting about the middle of September, 1915, the number of cases increased rapidly, reaching the maximum about the latter ter part of October. A diminution was perceptible in November but it declined rather slowly until February by which time it may be considered that the epidemic prevalence had terminated. I attended a patient with dengue late in March and sporadic cases will undoubtedly occur from time to time. Estimates of the total number of cases vary exceedingly. Evidently it ran well into the hundreds or possibly thousands if allowance is made for the numerous mild and evanescent cases. Many such occurred often unattended by any physician and are only explainable by considering them a light or abortive type of the prevailing disease. I was frequently told of such attacks, too indefinite for accurate diagnosis but suggestive of dengue, experienced by my informant or occurring in the family or among friends. Typical dengue was common enough in all forms from mild to severe. I saw several patients who appeared dangerously ill, so much so that their attending physicians were much concerned as to the outcome but all of them made good recoveries and I have been unable to learn of any death attributable to dengue directly or indirectly. The Director of Sanitation of Porto Rico informed me that the epidemic had no perceptible effect upon the death rate.

Several factors usually of epidemiological importance apparently played a very minor role if any in this epidemic. The topography and physical characteristics although differing materially in the different parts of the city did not seem to have

any influence. What effect these conditions may have upon mosquitoes theoretically there was none practically because mosquitoes were plentiful in all sections, and in all, the disease was present in more or less the same degree, nor could I learn that it started in any particular part. Admitting the possibility of early cases being overlooked, the earliest ones of which I could get information occurred about the same time and were well distributed in the three divisions of the city.

No sudden or unusual influx of non-immunes into an endemic area had taken place. Neither did the disease show preference for the newly arrived, rather the contrary as all but a small percentage of the patients were native born or residents since considerable time. I did see patients who had been in San Juan only two or three weeks but these cases were quite exceptional.

Weather conditions previous to and during the epidemic were somewhat abnormal. Many expressions of complaint were heard about the unusually warm weather. Official records show an average temperature slightly above normal, more noticeable on account of exceptionally light and variable winds until December when a period of high winds and cooler weather began. Rainfall was only one-third to one-half of the normal before and during the increase of the epidemic and somewhat in excess during the decline. General humidity showed practically no variation.

Culex and aedes are the common mosquitoes in San Juan and are constantly present in greater or lesss number. That the number was greater at the time of the epidemic was generally remarked by both physician and layman. During December, anti-mosquito measures were put into effect, and whether due to them or to natural causes or to both, it is certain that, during the decline of the epidemic and since, there has been a diminution in the number of mosquitoes. In view of the general acceptance of the mosquito transmission of dengue, this superanbundance of them is the only epidemiological factor of sufficient importance to explain the outbreak, and the facts seem in accordance with the rule observed in yellow fever by American and French physicians, that epidemics may occur in endemic areas when, in the presence of sufficient non-immune population and other favorable conditions, the number of mosquitoes exceeds a certain

proportion to the number of sources of infection, and will cease when this proportion diminishes below a certain point, even without the total extinction of the mosquitoes.

Another fact in conformity with mosquito transmission was the occurrence of secondary cases in the same house. In two instances, in which I was able to fix the time of the appearance of these secondary cases, it was 13 and 14 days, respectively, from the beginning of the first case to the beginning of the second. In other families several members were stricken about the same date, or within 2 or 3 days, as if bitten by the same mosquito.

The disease did not respect social grade or nationality. It attacked persons of the highest class living under the best hygienic conditions (except for the presence of mosquitoes) as well as those of the poorest and most unhygienic. Porto Ricans were attacked equally with Americans, English, Spanish and others. No preference was shown for either sex.

An exceptional feature of this epidemic was the rarity of cases in elderly persons in contradistinction to the statement of Reboul that "age, sex, race, social conditions, have no influence on the production of dengue." Comparatively few cases were seen in persons over fifty years of age and, in those coming within my knowledge, the maximum age was sixty-four. On the other hand, there was a decided preference shown for youth and childhood, even infancy, and the number of victims within the first decade of life seemed to indicate that it was the most susceptible period. The youngest patient whom I saw was a baby of thirteen months who developed a most typical rash. This scarcity in persons of more advanced years can hardly be attributed to immunity conferred by previous attack because the disease has not seemingly been sufficiently prevalent to immunize so many persons. Moreover the question of immunity in dengue has not been determined. Authors are not in agreement as to whether immunity results, and if so, how long it lasts. In this connection it is worthy to mention that the only history of a previous attack which I could obtain was from the patient of sixty-four years, a physician who distinctly remembered suffering with dengue in the United States fifteen years before. I did get a history of previous dengue, or very suspicious symptoms, from

several persons who were more or less exposed by living in the same house with dengue patients during the present epidemic but who did not contract the disease.

I did not personally see a case in a negro or dark mulatto but my opportunities for doing so were somewhat limited. Neither have I been able to hear of any physician reporting a case in members of that race. At the same time, I have been informed by a city physician whose district includes a large negro population that there was an increase of fever among them about the same time that the dengue was epidemic. Gastric symptoms were frequently met with and the cases were called gastritis or some similar diagnosis. After a purge, the fever disappeared in one to three days. It is probable that some of these were dengue cases.

Considered in its general aspects the epidemic was a typical one in its onset, course and duration. The cases were more numerous, I believe, than was realized even by physicians, and showed great diversity in their individual minor features but with the exception of a comparatively small number, the general clinical picture left no doubt as to the diagnosis. All types of dengue were represented.

The importance of the disease notwithstanding its almost absent mortality, will surely be appreciated by anyone who has suffered a well marked attack or who has seen many cases during an epidemic. The rapidity with which it may attack communities, ship crews, armies, etc., with the result of incapacitating large numbers of persons, often for considerable time, gives it an economic phase lacking in many diseases to which more attention is given. Furthermore the resemblance between dengue and yellow fever during the first days of the attack makes dengue specially important to quarantine and sanitary officers and physicians generally, where both diseases may occur. Early differentiattion is a prime necessity if harm to the community and individual is to be avoided. The two diseases have been confused more than once, and more or less disastrous consequences may follow a mistake in either direction even when promptly rectified. The difficulty is immensely increased when the two occur simultaneously as has happened.

THE CLINICAL TYPES OF DENGUE IN THE PORTO RICO EPIDEMIC OF 1915.*

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(From the Institute of Tropical Medicine and Hygiene of Porto Rico.)

In a separate article, entitled "The Epidemic of Dengue in Porto Rico, 1915," I have given a brief account of the general features of this epidemic, and in the present paper, I wish to discuss the clinical aspects of the disease as I observed it. I was especially interested, from official, professional and personal motives, in making an investigation of it, and thanks to the kindness of my professional brethren, too numerous to mention individually, I had exceptional opportunities for getting data and seeing a wide variety of cases beside those under my personal care. In this way, I was enabled to see dengue patients of both sexes, in all walks of life, and varying in age from thirteen months to sixty-four years. The rarity of the disease in persons of advanced age was a noticeable feature of the epidemic, childhood, seemingly, being the most susceptible period. Among negroes, I did not see a single case but my opportunities were somewhat limited in that direction. I was informed by a city physician in whose district there are many negro residents, that there was an unusual number of fever cases among them at the time of the prevalence of dengue.

I have more or less complete notes on 41 cases but there were many others that came to my knowledge in various ways and from which I often obtained valuable points. These cases comprised only a small proportion of the entire number which ran well into the hundreds, or possibly thousands, but they were so diversified that I believe they well represented the clinical features of the disease.

Like other acute fevers, dengue may vary exceedingly in its clinical manifestations, not only in degree from the mildest to the most severe, even fatal, but also in the exaggeration, or the reverse, or its important symptoms. These variations may all occur and probably do in the course of any extensive epidemic. At the same time, in reading the accounts of dengue as described

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by different observers in different times and places, it seems that certain symptoms or types of the disease may be more in evidence in some epidemics than in others, with the result that clinical descriptions vary somewhat. It is very evident that the very mild and atypical cases have sometimes been ignored or given scant notice, and a tendency shown to restrict the diagnosis of dengue to cases of a certain type only, and to characterize others by other names. Rogers' seven day fever is regarded by most authorities as a variety or type of dengue, an opinion which my experience in this epidemic leads me to support for the following reasons. It is possible but hardly probable that dengue and seven day fever, as different clinical entities, should both be unusually prevalent at the same time and place. In the cases coming under my observation, some followed more closely the description of dengue as stated by Rogers in "Fevers of the Tropics," others took more the form of his seven day fever, but a sharp line of division could not be drawn because so many presented features of both forms.

As in similar diseases, any attempt to classify a number of dengue cases into various types is found difficult because of the absence of distinctive points to differentiate the types. The interdemiate and mixed forms occur so frequently, partaking in some degree of one type and again of another, that no classification is free from criticism. That given by Castellani and Chalmers, quoting Megaw, is the most satisfactory that I have seen. It is based chiefly upon the course of the temperature, and names four types which well cover the different manifestations of the disease provided due allowance is made for more orless variation within the type. I observed typical and atypical cases of them all.

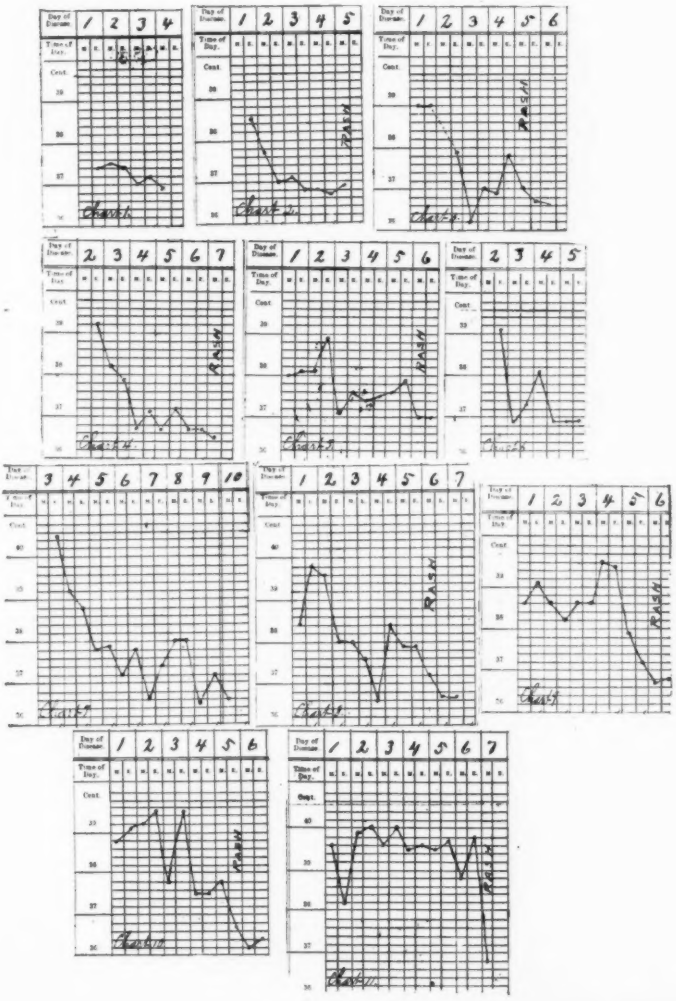
Evanescent type. During this epidemic, there occurred numerous cases of illness which after an onset more or less like that of dengue, experienced in a few hours or one day a rapid amelioration of the symptoms, and complete recovery in a day or two more. The symptoms while suspicious, were in themselves not sufficient for a positive diagnosis of dengue. The following cases affords an excellent illustration of this type.

> J. C. Was in his usual good health upon retiring, December 10, but was restless during the night, not sleeping as well as was his custom. Awoke about 6

a. m. feeling feverish and sick, and became progressively worse until about 10 a. m. Skin was hot and dry. Severe headache, especially across the forehead and eyes, accentuated by moving the eyes. Severe aching pains in the limbs, and across the back just above the sacrum. Conjunctivæ injected and watery. Constipated. Anorexia but no nausea. No coryza nor respiratory symptoms except a slight hacking cough at long intervals. About noon there was a very slight chill or chilly sensation followed by sweating. I saw him at 3:30 p. m., by which time the above symptoms had considerably diminished. Skin moist with slight continual perspiration. Temperature 37.7 degrees C. Pulse 84. Blood negative for malarial parasites. Leucocyte count 7900. Urine negative for albumin, positive for bile pigments. A purge was prescribed which gave moderate results by the following morning. He slept well that night and felt well during the following day except that he felt somewhat "knocked out" as he expressed it. Leucocytes 7000. Urine negative for albumin and bile pigments. The attack had practically disappeared in another day and there was no return of symptoms. He was instructed to look carefully for the rash but reported that none appeared.

Cases of this type did not always show such severe and characteristic symptoms, probably the majority did not. It was very common to get a history of slight feverishness lasting one or two days, loss of appetite, malaise, and some aching in the head, back and limbs. I was able to follow closely a patient with such mild symptoms, whose temperature lasted two days without rising above 37.5°C., (Chart 1) but whose leucocytes fell to 2200 with enormous relative increase of small lymphocites. Careful observation failed to detect a rash. Comparatively few of the patients with this type of dengue felt ill enough to remain in bed even for a day, nor to need the services of a physician. I saw the rash twice in cases of this type, both in children. In one, it appeared on the third day; in the other, on the fifth day although the fever lasted but a day and a half. (Chart 2) From other patients I never obtained a history of its occurrence, and it seems probable that cases of this type rarely present it or, if they do, it may come out but very slightly and perhaps, as in the above case, only after some days have elapsed since the

fever, about the time it would be due had the disease run its full course, i. e. fifth to seventh day. Such late occurrence was also seen in cases of a more severe type in which the temperature dropped to normal after the initial fever and remained so, but the rash did not appear until three days later, after the time



when the secondary rise should have appeared. Unless very well marked, such late appearing rash might scarcely be noticed by the patient, or, if so, would be attributed to other causes, as insect bites, etc. Even were a physician called, he would ordinarily have discharged the patient as recovered, before the appearance of the rash. It seems reasonable to suppose that the causative agent capable of producing, in the particular subject, only short or slight symptoms of fever, pain, etc. and failing entirely to cause some of them, should likewise produce but a weak, indefinite eruption or none at all.

The behavior of the leucocytes in dengue has drawn the attention of various observers, and I am now engaged in making differential counts upon a number of blood smears taken from dengue patients. The counts have not yet been critically studied and will have to be the subject of a future paper. At the present time I can only say that apparently the leucocytes in this type of the disease are subject to the same weakened influence of the causative organism. As a rule the changes were less marked than in the more classical forms. The leucocytes were less reduced, and the variations in the lymphocytes were not so great, but this rule is far from being absolute as shown by the second case above mentioned. When these changes do occur they afford valuable diagnostic aid.

That these cases were true dengue can scarcely be doubted. Aside from their suggestive symptoms, there is the striking fact that they increased and diminished in frequency pari passu with cases of the more easily recognized types. Undoubtedly they were a fruitful source of error or omission in diagnoses, in spite of the presence of the epidemic. In sporadic cases, the difficulty is vastly greater, and not a few of them taken individually would be found impossible of diagnosis, but a physician having experience with such cases, should be able to recognize the majority of them after a careful consideration of the symptoms in conjunction with the data supplied by examinations of the blood and the urine.

I have discussed this type at some length because I believe that it has relatively great importance from an epidemiological point of view, and has often been given less attention than it deserves. By analogy we must suppose that cases of this type

may be sources of infection producing more severe attacks in more susceptible persons, and undetected or miscalled may be an important factor in keeping the infection alive in endemic areas.

Interrupted fever type. I found this type much less common than the next, or saddle-back type. Except for the greater fall of temperature after the primary paroxysm, so that the remission becomes an intermission (Chart 3), these two types do not materially differ and might be considered variants of a single double paroxysm type. In either, the remission or intermission may last from a few hours to two or three days, and I have charts showing different levels to which the temperature fell during this period, so graded that it is difficult to say where one type ends and the other begins, neither do other symptoms differentiate them.

Two variations of this interrupted fever were noted:

a—That observed in three severe cases bearing a striking similarity to each other in that there was a relatively mild primary attack of moderate fever, pains and others symptoms, followed by a rather long apyrexial period which in turn was followed by a prolonged and particularly severe second paroxysm with higher fever, more pain, prostration, etc. The intermission lasted two days in one case and three days in the other, during which the patients although feeling "achy" and indisposed, went about their usual occupations. One man went to spend the week end in the country where he engaged in sea bathing and horse back riding, in the belief that he needed exercise to "work off" his ill feeling. In each case an unusually profuse and well marked dengue rash appeared somewhat tardily, eighth or ninth day, and lasted three days or more.*

b. Those cases in which there was the customary primary fever and return to practically normal, but without the secondary rise, or, if it did occur, it was too short and insignificant to be shown on a four-hour temperature chart, or by the feelings of the patient. In other respects they did not differ from typical cases, the symptoms and the course of the attack being similar except that the temperature continued normal. The appear-

*I was unable to secure temperature charts of these cases because the attending physicians had not kept the records.

ance of the rash was hastened by the omission of the secondary fever, but occurred at its proper time just as if the precritical rise had occurred. (Chart 4.)

Saddle-back Type—This was by far the one most commonly seen and may be regarded as the classical type of dengue. It was characterized by initial fever, remission and secondary rise less pronounced in height and duration than the first. The following case is a good example:

> K. A. Feb. 12. At 4 a. m., awoke with splitting frontal headache. No definite chill but felt alternately cold and hot. Severe aching pains in the back, arms, and legs. Most pain felt low down toward the sacrum and near the articulations, made worse by pressure or movement. A feeling of tension and soreness in the abdomen, and slight tenderness on pressure. More or less pain in all muscles, even the chest muscles were sore so that deep respiration was painful. No appetite but no nausea. Tongue slightly coated. Constipated. No nasal or respiratory symptoms. Eye balls very painful on movement. Conjunctivæ injected, brilliant, watery and with the faintest detectable yellowish tint. Temperature at noon 38 degrees C. Pulse 78. The clinical picture that of an acute, sthenic fever with excessive pain.
>
> Feb. 13. Fever and pain more marked especially the pain across the eyes, and the abdominal discomfort.
>
> Feb. 14. Temperature nearly normal. Fairly comfortable except for some persistent pain across the eyes, and the abdominal distress.
>
> Feb. 15. Much better. Conjunctivæ clear.
>
> Feb. 16. Some return of discomfort. Chilly sensations. Slight rise of fever.
>
> Feb. 17. Perspired freely during the night. Temperature normal. Feeling comfortable except for weakness and prostration. Faint but definite rash on legs, arms and chest.
>
> There was no further fever but convalescence was rather slow. The temperature and pules curves are shown on the accompanying chart, No. 5.
>
> The blood was negative for malaria. At first examination, 8 hours after onset, the leucocytes numbered 4600 per cmm., and at the second examination, 28 hours later, they were 4400. The leucopenia persisted for weeks after recovery. The lymphocytes were greatly

reduced at first but rapidly increased far above normal. The urine did not show albuminuria but did show bile pigments on the first and third days with none on the second or later days.

By no means did all cases run so true to type as the one detailed above. More or less variation occurred in the course of fever as well as in the prominence and severity of individual symptoms. The principal differences observed were:

a. Cases in which all the stages were shortened. The primary fever was of short duration, followed by a remission of only some hours or a day and a short moderate precritical rise, whole febrile period lasting only three or four days. (Chart 6.)

b. The oppositite to *"a,"* in which all or some of the stages were prolonged, the normal not being finally reached until the seventh to ninth day. (Chart 7.)

c. Those in which the remission was very short, less than one day. In these cases the fever rose again to about the same level that it had attained before, and continued longer, covering the time ordinarily passed in remission, so that the attack was not shortened by the brevity of the intermediate fall. (Chart 8.)

d. Those in which the fever in the second period rose to a higher degree than in the first. In such event, this exaggerated precritical rise was accompanied by a more noticeable return of symptoms than when the rise was slight. In no case were these symptoms comparable to those of the first days. (Chart 9.)

e. Those in which the final return of temperature to normal resembled lysis rather than crisis, two or three days being occupied by the decline. (Chart 10.)

Continued Fever Type—This type of fever without definite remission was decidedly rare. (Chart 11.) To it belonged a severe case in a baby of thirteen months, whom I did not get to see until late in the attack. Unfortunately, the early temperatures were not recorded. The attending physician stated that there had been high and continued fever, much vomiting, rigidity and retraction of the head, leading to the diagnosis at first of meningitis. Crisis took place during the night, and the mother was unable to state whether it was accompanied by

sweating or any critical phenomenon. The patient awoke with normal temperature and broken out from head to foot with the typical mixed form of dengue rash.

Without attempting a detailed description of the disease, I wish to discuss some of the prominent symptoms as observed in this epidemic.

Onset—Prodromata, if present at all, were so slight or indefinite that they may be practically ignored. Onset was sudden. Patients frequently related that after retiring feeling perfectly well, they awoke toward morning with a chill or severe headache. Sometimes the headache and fever developed more gradually, but seldom taking more than a few hours. A definite chill of medium intensity was frequently reported, chilly sensations often repeated during the first day or two were probably more constant. Vertigo was very common, often intense.

Fever—Fever usually rose rapidly, reaching its highest point the evening of the first or during the second day. In 21 cases seen early enough to allow reasonable certainty of observation, the maximum shown on the charts was 38° C. (100.40° F.) or below, in 2 cases; above 38° C., including 39° C. (100.2° F.), in 7 cases; above 39° C., including 40° C. (104° F.), in 11 cases, and above 40° C. in 1 case. During its primary phase it might oscillate somewhat, but soon began to decline, often slowly for a few hours, then more rapidly as by crisis, occasionally in a manner resembling lysis, to the level of remission or intermission, which customarily occurred by the third day, although this time could not be accurately determined because the beginning could seldom be correctly ascertained. Remission as early as the first day must have been rare except in very short cases, while it was not uncommon, apparently, late on the second. In one case, as nearly as the time could be fixed, it was delayed until the fifth day. In another case, the temperature of 40° C. on the second day regularly declined to normal on the sixth day and did not again rise. The remissions maintained a fairly constant level, lasting one, two or three days, most commonly about one and a half to two. Sometimes its duration was only a few hours. The secondary rise was generally about 1°, seldom more than one day in length, and

was ushered in by a slight chill in four of my cases.

Rogers apparently considers that dengue is a "three-day" fever in contradistinction to his "seven-day" fever, and cites a number of observers of dengue epidemics, who held that opinion. At the same time, his references mention an "ephemeral" or "trifling" secondary rise or "relapse," occurring occasionally "from the fourth to the sixth day." It is evident that they attached little importance to this rise, and knowing how "ephemeral" and "trifling" it may be, one cannot avoid the suspicion that it was overlooked or misinterpreted.

Coincident with the initial temperature are the customary febrile phenomena more or less marked, flushed face, injected and watery conjunctivæ with or without photophobia, sometimes tumefaction of the face and puffiness of the eyelids. During the stage of early acute congestion of the face, I noticed on several of the patients a faintest detectable icteroid tint to the complexion and conjunctivæ. It was very elusive and could best be seen by side light, too strong or too weak light, or direct light not being so suitable. It was a very early symptom, disappearing as the fever and intense congestion lessened, and did not return even if the fever rose again considerably. Associated with it was the presence of bile pigments in the urine, a point to be mentioned later.

Pulse—The pulse rate was a variable sign difficult to classify into types because of irregularities in its course, due probably to some of the many factors which may temporarily influence its rate. Passing over minor and inconstant oscillations, it was observed that the pulse rate ran a fairly good parallel to the temperature curve. An abnormally slow pulse during convalescence was not infrequently seen, a fact noted by Cozanet and by Reboul (1), who attribute it to the effect upon the circulation of the "nervous asthenia exceptionally marked which is produced at this period." I was shown one chart recording a pulse under 50 for several days, the lowest count being 43 per minute.

In this connection mention may be made of Rogers' (2) statement and citation of other authors that the pulse of dengue is very rapid and "shows a characteristic difference from

the almost invariably slow pulse of seven-day fever." Reboul (1), referring to the pulse of dengue, states "it is not in accord with the febrile state"; that it "varies between 80 and 120." Castellani and Chalmers (3) give the rate from 90 to 140, and that "it varies directly with the temperature." I found the pulse rate somewhat slower than would be expected with the degree of fever exhibited, the higher rates being more common in children. Of 25 observations of temperature above 39° C. including 40° C., the average pulse was 91; of 69 above 38° including 39°, it was 85, and of 93 above 37° including 38°, it was 79 per minute. Occasionally the increase of pulse rate coincident with the secondary rise of temperature was less in proportion to that with the same degree of primary fever, thus giving a suggestion of Faget's sign. This was noted only where the practical rise was of short duration, and in the case that showed it best yellow fever could be definitely excluded. Where the temperature was sustained longer, the pulse rose correspondingly.

In general, the pulse rate might be divided into:

a. That sustained at an average corresponding to about what might be expected from the degree of fever. I saw this more often in the milder types of the disease, or in children.

b. That which followed a course of relatively slow pulse, seldom above 90 per minute, except that some cases showed a sharp initial more rapid pulse for a few hours. The slow pulse of convalescence may follow after either type.

Pains—Pain is a symptom of such prominence that it has given numerous names to the disease. In the cases under consideration, it was extremely variable in degree from moderate aching to pain of such severity as to require some form of opium. At the same time no case came to my knowledge having such intense paralyzing pain that the patient could not move, instances of which are so frequently cited in the French literature on dengue.

Headache was always present, particularly located in the frontal and temporal regions but sometimes generalized. Painful eyeballs, made worse by movement, was a very common symptom, but less so than headache. Pain in the back and limbs was rarely absent, in one case markedly affecting even the fin-

gers. Patients usually complained of general muscular pain or ache, some being unable to localize it more specifically, others indicating one or more articulations as the location of the most severe pain, but the joints did not seem to be the seat of any inflammation, and often close examination and questioning revealed that the pain was not felt exactly in the articular surfaces but more at the tendinous insertions around the joint. I was struck with the frequency with which the patient located the greatest pain at two special points; in the back low down toward the upper part of the sacrum, and about the junction of the middle and lower thirds of the thigh. The abdomen was frequently the seat of pain or a feeling of tension and soreness, with the greatest intensity about the umbilical or the epigastric regions. Involvement of the intercostal muscles was not uncommon.

The headache at times was the first symptom, but as a rule the fever, headache and general pain began about the same time, and continued more or less together until the remission. The intensity of the pain was not necessarily in relation to the degree of fever except in a very general way. Some patients with high fever did not have nearly as much pain as others with a comparatively low temperature. With the remission of fever, the pains improved, to recur in milder degree with the terminal rise. A lingering of slight pain around the joints or a general feeling of stiffness and muscular discomfort occasionally continued some days or possibly weeks after the fever had returned to normal.

The character of the pain was a sensation of stiffness and soreness rather than inflammatory, an ache in the muscles, constant and annoying, rendering it almost impossible for the patient to find comfort in any position. Movement and pressure increased the pain.

Alimentary Canal—Symptoms referable to the alimentary canal did not play an important rôle in this epidemic. The tongue was always coated white or brownish, sometimes with reddened edges and tip, sometimes resembling "strawberry" tongue. Appetite was always lost. Nausea was frequently absent and vomiting still more rare unless induced by food or medicine. Vomiting was sometimes the first symptom in children. The digestive powers seem greatly disminished, and dis-

comfort occasionally followed the taking of too heavy or injudicious food. Constipation was the rule, at times obstinate, but not infrequently the bowels acted normally, less often moderate diarrhea was encountered. In four cases, all in children, the vomiting of clear fluid containing specks of bright and dark blood was reported to me. I did not see the vomit, but it was accurately observed by the attending physicians. In one patient there was chronically enlarged tonsils, and adenoids were suspected on account of mouth breathing, and in all cases there was high primary fever and congestion of skin and mucous membranes. In every instance, the vomiting of this character occurred during the early stages, and it is believed that the blood came from the congested tonsils or naso-pharynx. Goldberger and McCoy (4), in their report of the Brownsville (Texas) epidemic, 1907, mention three similar cases.

Liver and spleen were never found enlarged.

Respiratory System—Respiratory symptoms were conspicuous by their absence. There was nearly always congestion of the mucosae of nose, mouth and throat, and evidently it extended down into the trachea or beyond. A dry, hacking cough at intervals was fairly common, but was often so slight that it might easily escape notice. It promptly disappeared when the congestion was relieved.

Skin—The skin, dry early in the fever, usually became moist, and more or less perspiration continued during the attack. Crisis was often accompanied by profuse sweating.

An initial rash, definitely marked, was observed twice to my knowledge, but had more cases been seen early enough it might have been noted more frequently. It was scarlatiniform, principally upon the body and face, and lasted one day in one case, four days in the other.

Terminal rash was present in 82% of the twenty-eight patients whom I was able to observe personally at the proper time. The failures were mostly in the milder cases. I was informed of the rash in numerous instances by both physicians and patients, but only too often I was told that it was not looked for even by the physician. This eruption took three forms, (a) an extensive erythema resembling scarlatina but more patchy, (b) resembling measles, and (c) smaller, darker, more sharply-

defined macules, in some instances resembling mosquito bites. Rarely was one type seen without association with one or both of the others, giving quite a characteristic picture. In color, it varied from a brilliancy almost that of scarlet fever to a barely perceptible redness. In one case it was associated with some urticaria to which the patient stated he was subject.

Itching was not uncommon, especially when the eruption was fading, and in several it was quite annoying for a day or two. only after the eruption had been very marked. In distribution, the arms, chest and abdomen were the favorite sites in the order named, but face, neck, thighs and back were frequently invaded. I saw the entire integument, including palms and soles, involved more than once. In degree, it varied from a few scattered macules to such abundance that the finger could hardly be placed anywhere upon the skin without touching the eruption. It was commonly well marked, but when very slight and indefinite it could easily be overlooked. The time of its appearance in the vast majority of cases was immediately following the final return of the temperature to normal after the terminal rise of fever, i. e. fifth to seventh day. In those cases in which I could reasonably well calculate the day, 50% developed the eruption on the sixth, one as early as the third, and another as late as the ninth day. Duration was from a few hours to several days. I heard of, but did not see, one eruption said to have remained two weeks. Generally it had faded in one or two days.

Urine—It was not possible for me to secure accurate data on the total secretion of urine. Patients variously stated that it was normal, or more abundant and light colored, or diminished and dark. In two instances there was almost complete suppression for two or three days of the secondary fever, only a few ounces being passed during each twenty-four hours. Both patients had high fever and were very ill, but presented no special symptoms referable to the inaction of the kidneys. The urine in each case was concentrated, high colored, and showed casts and epithelium. One gave traces of albumin, the other a somewhat larger quantity. Both patients made good recoveries. In other cases, albumin was not found in the urine except where assignable to causes other than dengue. The tests used were nitric acid, and boiling after the addition of sodium chloride

solution and acetic acid. Biliary pigments were very frequently found in the urine, by the Hay test, during the first three days of the disease, never later. The reaction may show only a trace. The observations on this point are too few to draw positive conclusions, but if this symptom is found to be sufficiently definite and constant it may prove to be a point of considerable diagnostic importance if Clarac and Simond (5) are correct in their statement that biliary pigments in the urine appear late, if at all, in yellow fever.

Blood—A leucocyte count of less than 7,500 per cubic millimeter was encountered in twenty-one of twenty-four cases. Of the three exceptions, two were in children, and the third was late in the disease, corresponding to a time when I have, on several occasions, found a transitory excess of leucocytes. The highest count of the twenty-one was 7,100, the lowest 2,000. The leucopenia appeared early, during the first or second day, and has been given as a point in the diagnosis between dengue and yellow fever. It has been stated that leucopenia occurs in yellow fever also, hence this symptom loses in value in differentiating these two diseases unless it can be demonstrated that there are differences in the degree, kind, course, etc., of the leucopenia. In dengue the leucopenia is early, as I have stated, and in some cases was followed by a leucocytosis, more or less transitory, late in the attack or during convalescence. Lymphocytosis was nearly always present. I am now engaged in examining a large number of blood smears taken from dengue patients and hope that in the future I may be able to present some observations upon the the leucocytes in dengue. However, a preliminary statement may be made now in regard to the Arneth counts, especially as it has a very decided bearing upon that important question of diagnosis between yellow fever and dengue. Macfie (6) has recently published some observations on Arneth counts in yellow fever, in which he found such early and profound shift to the left that the Arneth indexes in two cases were 93 and 95.5 on the second day, and 90 and 87 in two other cases on the third day. My Arneth counts from dengue cases will apparently show, when tabulated, a slight shift to the left, but nothing comparable to that quoted above. If this difference is found constant, the Arneth count will be most valu-

able as an early sign in differentiating these two diseases.

Convalescence—The slow convalescence so frequently described in dengue was the rule in this epidemic, although a fair number were more fortunate in making speedy recoveries. The lack of energy, physical, mental and nervous, seemed unduly marked in proportion to the length and severity of the actual illness. Appetite was slow in returning. The feeling of mental and muscular fatigue persisted for weeks, and final recovery of the patient's normal health often seemed to be retarded by too early efforts to get up and about. Naturally these effects were less noticeable after the milder attacks, but it was surprising how marked this condition could be following such a mild attack that the physician was not consulted until relief from this depression was desired.

Complications and Sequelæ—Complications were rarely observed. There was some tendency for any pre-existing disease or condition to become aggravated, or if the patient was subject to attacks of any kind, such as filarial lymphangitis, neuralgia, acne, diarrhea, dyspepsia, etc., a fresh attack was liable to be precipitated. No hemorrhagic tendency was observed except the so-called "black vomit" previously mentioned, and the premature appearance of menstruation in some women. A fellow practitioner told me of a case in which pregnancy six months advanced apparently suffered no disturbance.

In my own case, I suffered parasthesia in the distribution of the sensory fibers of the ulnar nerves, slight in the right hand, causing no inconvenience and passing off without treatment in a couple of weeks; in the left hand, on the contrary, it was so marked that it caused great annoyance and interference with the use of the hand for weeks and, while gradually improving, has not yet entirely disappeared eleven months after the attack. I was informed of another patient who remained in a lowered state of health for some months after a very severe attack, and then developed sensory and motor symptoms in the distribution of some branches, including the ulnar, of the brachial plexus. Such nervous manifestations have been prominently mentioned by French writers, and together with the character of the pains, prostration, nervous asthenia and protracted convalescence,

seem to indicate a predilection on the part of dengue for the nervous system.

A complicating nephritis may be considered in the two cases with suppression of the urine, although edema and other symptoms of acute nephritis were absent.

Immunity—The epidemic afforded little light upon the disputed question of immunity. I saw only one patient giving a history of a previous dengue, an undoubted attack fifteen years ago. On the other hand I know several persons who had had dengue from one to ten years previously, and who did not contract the disease during the recent epidemic in spite of being repeatedly exposed by living in the same house with dengue patients.

Relapse—Relapses are as much in dispute as immunity. On this point I have one doubtful and two positive observations. Exactly three weeks after my initial chill, and fifteen days after the fever had entirely ceased, I had another chill lasting an hour and a half, followed by fever of 39° C. and symptoms resembling my first attack. Without medication, the symptoms abated, and the fever disappeared gradually in about thirty hours. In the second case the fever returned on the fifteenth day from the onset of the first fever, and on the ninth day after temperature had become normal. It was preceded by a slight chill and accompanied by pronounced symptoms suggestive of the original attack. The temperature rose to 37.9° C. and fell by a critical sweat in about twenty-four hours, with relief of symptoms. The doubtful case was one to which I was recalled on the twenty-first day from the beginning, and the fifteenth after the end of the primary attack, with the statement that "the dengue was returning." I found the symptoms rather indefinite and temperature only .2° C. above normal. Both had disappeared by morning, hence I prefer to regard it as a doubtful relapse. In all three instances, blood examinations excluded malaria. I am convinced that relapses would have been noted in a larger proportion of cases had it been possible to keep all patients under close observation for some weeks.

San Juan, Porto Rico, April, 1916.

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6.—Macfie, J. W. Scott, "Arneth Counts in Yellow Fever," **Journal of Tropical Medicine and Hygiene,** London, February 15, 1916.

THE AMERICAN SOCIETY OF TROPICAL MEDICINE

Fourteenth Annual Meeting, New York City, June 4 and 5, 1917.

Members intending to read papers should communicate at once with the Secretary, Dr. John M. Swan, 457 Park Avenue, Rochester, New York.

AMENDMENT TO THE BY-LAWS PROPOSED AT THE THIRTEENTH ANNUAL MEETING TO BE ACTED UPON AT THE FOURTEENTH ANNUAL MEETING.

We the undersigned move that Article III of the By-Laws of the American Society of Tropical Medicine be amended by striking out the words, "The President and the Secretary shall be ex-officio members of the Council," and substituting the words, "The officers shall be ex-officio members of the Council." By striking out the word, "In 1905 three Councillors shall be elected for two years and two Councillors for one year. Thereafter each Councillor shall be elected for two years," and substituting the words, "In 1917 one councillor shall be elected to serve one year, and one to serve two years. In 1918 one councillor shall be elected to serve three years, one to serve four years and one to serve five years. Thereafter each councillor shall be elected to serve five years.

In case of death or resignation of any officer or Councillor of the Society, the Council shall be empowered to fill such vacancy until the next annual meeting.

(Signed)

Thomas H. Fenton,
Isadore Dyer,
John M. Swan,
M. J. Rosenau.

CURRENT LITERATURE

INTESTINAL PARASITES: AN ITALIAN REPORT.—Sangiorgi* has examined the feces of 2,620 soldiers in military hospitals in Venice. Of these 1,000 (38.13%) were infested with helminths, the infestation being sometimes double. The summary of species found is as follows:

Number of soldiers.	Species found	Per cent of whole number examined.
429	**Ascaris lumbricoides**	22.4
389	**Tricocephalus trichiuris**	21.3
169	**Ascaris lumbricoides** and **Tricocephalus trichiuris**	
6	**Anguillula intestinalis**	0.26
3	**Tenia saginata**	0.15
1	**Tenia saginata** and **Tricocephalus**	
1	**Anguillula intestinalis** and **Ascaris.**	
1	**Anchilostoma duodenalis**	0.07
1	**Anchilostoma duodenalis** and **Tricocephalus.**	

The infested were classified by provinces and by occupations. The majority were peasants (contadini) as to residence, and were those who by their work either directly or indirectly (water, dust, etc.) had the more frequent occasions for contaminating themselves from the ground. In general this infestation was more common in the soldiers from South Italy than in those from North Italy. Neither case of ankylostomiasis showed clinical symptoms; one had been a miner in Brazil (native of the province of Forli), the other was a gardener from the province of Salerno. The danger presaged by these sporadic cases is emphasized and routine examination for *Anchilostoma* urged.—*Lodilla Ambrose, Ph. M.*

FILARIA IN ITALIAN WOODPECKER.—Borini† has recently reported the finding of filariæ in a new species of woodpecker. The filariæ encountered previously in various woodpeckers are *obtuso-caudata, quadriloba* and *insignis.* In this instance the filarial masses were found in the thoracic and abdominal cavities of the *Sitta Cæsia* taken in hunting near Turin. Borini gives a full description of this filaria together with text illustrations,

*Sangiorgi, G. Osservazioni sulle feci dei soldati occorsi negli ospedali militari territoriali di Venezia. Giorn. d. R. Accad. d. Med. di Torino, 1916, lxxix, 177-181.

†Borini, Agostino. Filaria nei sacchi aerei del Picchio murstore (**Sitta Caesia,** Wolf). Giorn. d. R. Accad. di Med. di Torino, 1916, lxxix, 273-277.

and suggests as a name for it *Filaria Cæsia,* from the hosts in which it was observed.—*L. A.*

A NEW FLAGELLATE.—Sangiorgi and Ugdulena* report a flagellate found in the course of the examination of the feces of a soldier in the military hospital in Venice. Full descriptions are given and also their methods of cultivating this flagellate *in vitro.* For this new species they propose the name *Prowazekia italica,* as it is the first species of this genus reported from Italy. Eight other species of *Prowazekia* are listed together with the literature.—*L. A.*

CHENOPODIUM POISONING.—A care of severe poisoning by oil of chenopodium is reported by A. F. Coutant, New York (*Journal A. M. A.,* November 25, 1916), the only one of 300 cases treated with this method under his observation. The advantages of chenopodium over thymol in the treatment of hookworm disease have been pointed out, and are probably well known to the profession, and but few cases of toxic effects from its use have been reported. In the case here described the patient had only taken altogether 20 minims of the drug, in two doses, twenty-four hours apart. The symptoms were severe prostration with intense headache and twitching and tremors of the limbs, with sweating and fever. The patient was irrational for several hours. There was also local intestinal disturbance, with cramping pains in the abdomen and bloody and mucous stools. The patient was suffering from malaria as well as hookworm, prior to the administration of the drug, and Coutant says that "Whether the general condition of the patient, including his chronic malaria, or some undiscovered lesions of the intestine which allowed an unusual absorption of the drug are responsible for these extraordinary manifestations, or whether this is a case of constitutional drug idiosyncrasy, it is impossible to say." The case is specially notable from the comparative smallness of the dose, and this may be the reason for the patient's quick recovery. Coutant recommends greater caution in the giving of this drug to some patients who have chronic diseases.

*Sangiorgi, G., and Ugdulena, G. Reperto di un flagellato **(Prowazekia n. sp.)** nell'intestino umano. Giorn. d. R. Accad. di Med. di Torino, 1916, lxxix, 169-176.

CORRESPONDENCE

Villa Americana, December 3, 1916.

Estado do Sao Paulo, Brazil, S. A.

NEW ORLEANS MEDICAL AND SURGICAL JOURNAL, New Orleans, La.:

Sirs—In your JOURNAL of October I note a case of diarrhea, by Dr. John B. Elliott, Jr., which seems, as he says, caused by parasites. If it does not seem too simple, tell him to try the following recipe:

American (or German) Dover's powders.... 5 grains
Sublimated sulphur .....25 grains
M. One capsule.

Take one two hours before meals on absolutely empty stomach and use no milk or diet, but a wineglass of claret with a little water during meals. Then one-half hour after meals (t. i. d.) the following (*one large tablespoon at a dose*):

Fowler's solution ..... 80 drops
Tr. nux vom. .....100 drops
Elixir of pepsin (French formula)..... 20 ounces
M.

Pardon the presumption.

(Signed.) *Cicero Jones, M. D.*

P. S.—I use this and have used it for twenty-five years with perfect success in this tropical diarrhea .Of course not alone, always, but colleague seems to have used all the rest. *C. J.*

NEWS AND COMMENT.

MEETING OF THE EYE, EAR AND THROAT SPECIALISTS.—The annual meeting of the American Academy of Ophthalmology and Oto-Laryngology was held in Memphis, December 11-13, under the presidency of Dr. John E. Brown, and the following officers were elected: President, Dr. William L. Dayton, Lincoln, Neb.; vice presidents, Drs. Edward Stieren, Pittsburgh, Alexander C. Magruder, Colorado Springs, and John Green, Jr., St. Louis; secretary, Dr. Lee M. Francis, Buffalo (re-elected), and treasurer, Dr. Secord H. Large, Cleveland (re-elected). The next annual meeting will be held in Pittsburgh.

COCAIN AND OPIUM PROHIBITED.—According to a report from the United States consul general at London, December 14, 1916, prohibition to import cocain and opium, except under license, has been declared by the British government. Cocain includes all preparations, salts, derivatives or admixtures containing one-tenth of 1 per cent or more of cocain, or liquid extract of cocoa containing a like amount of the drug. Opium includes any solid or semisolid mixture containing opium.

MEETING OF SOUTHWESTERN PHYSICIANS AND SURGEONS.—At the annual meeting of this association, held in December, the following officers were elected: Dr. Joel J. Butler, Tucson, Ariz., president; Dr. Robert E. McPride, Las Cruces, N. M., editor of the *Southwestern Medical Journal*, vice president; Dr. James W. Laws, Lincoln, N. M., second vice president; Dr. Douglas W. Detwiler, El Paso, Tex., secretary-treasurer, and Dr. Abraham G. Shoortle, Albuquerque, N. M., trustee for three years. Col. George E. Pushnell, M. C., U. S. A., Fort Bayard, N. M., was elected president emeritus.

CORINNE CASANAS FREE CLINIC OPENS.—The formal opening of the Corinne Casanas Free Clinic for the Poor and the Nurses' Home of the New Orleans Presbyterian Hospital took place on January 16, 1917. A large number of prominent citizens attended the opening and inspected the buildings of the clinic and the home. Each visitor brought a package of linen for use in the hospital and clinic. The exercises were opened

with prayer by the Rev. Gordon Bakewell and addresses were delivered by many prominent physicians, among whom were Drs. Isadore Dyer and Charles Chassaignac, deans of the School of Medicine and the Graduate School of Medicine, Tulane University, respectively; Dr. Paul J. Gelpi, president of the Orleans Parish Medical Society; Drs. K. Winfield Ney, W. D. Phillips and C. G. Cole, of the Presbyterian Hospital staff. A reception followed and congratulations were extended to the Rev. John C. Barr, D. D., the Board of Managers and the medical advisory committee and all who in any manner were contributing to the comfort and care of the poor. The new Corinne Casanas Memorial cost upwards of $55,000 and many who inspected the building were of the opinion that, while it was not as large as many others, no other clinic was better prepared to do the work for which it was created.

Award for Research on Leprosy.—Privat-Dozent J. Kyrle, of the University of Vienna, was awarded 1,000 kronen ($200) by the Austrian Academy of Sciences to continue his experimental researches on leprosy.

Discriminating Measures Against Women Physicians in Italy Withdrawn.—All measures discriminating between civilian men and women physicians in active military service have been withdrawn by the Italian Minister of War, says the *Revista Critica di Clinica Medica.* Women physicians are urged to accept positions in the advanced lines, stating their qualifications and specialties in applying for positions. Those with less than five years of medical practice will be appointed "medical sublieutenant"; those with more than five years of medical practice will be medical lieutenants and those with fifteen years' practice will rank as captains.

Mortality from Measles Very Low.—While measles has prevailed to a large extent in New Orleans during the last year, the mortality has been very low. Out of the reported 3,800 cases to the Board of Health and the estimated 1,200 that were never recorded, there were only twelve deaths from the disease for the whole year of 1916.

Congress on Internal Medicine Elects Officers.—At its second meeting and first scientific session, held in New York,

December 27 and 28, the American Congress on Internal Medicine elected the following officers: President, Dr. Reynolds Webb Wilcox, New York; vice president, Dr. Elias H. Bartley, Brooklyn; secretary-general, Dr. Heinrich Stern, New York; assistant secretary, Dr. Joseph H. Byne, New York; councilors for five years, Dr. Jacob Kaufmann, New York; Dr. Charles G. Jennings, Detroit; Dr. Judson Daland, Philadelphia; Dr. Francis X. Dercum, Philadelphia, and Dr. Arthur W. Fairbanks, Brookline, Mass. As announced by the secretary, the organization already has a paid-up membership of over 300 and many applications for membership.

Baby Week for 1917.—The Children's Bureau, United States Department of Labor, is making plans for a bigger and better Baby Week for 1917. May 1 is the time settled on by the bureau and the General Federation of Women's Clubs, and they urge that this week be adopted wherever local conditions permit. Persons interested in the planning and management of a Baby Week can obtain, without cost, a bulletin on the subject by applying to the Children's Bureau, Washington, D. C.

Louisiana State Board Raises Standard.—The Louisiana State Board of Medical Examiners, at its meeting December 1, 1916, adopted a resolution providing that, beginning with the session 1918-1919, no medical school or college will be considered in good standing that does not require for adimssion at least two years of work in an approved college of arts and sciences. Licensing boards have adopted the two-year standard in seventeen States.

Eradication of Ragweed.—Legislation for the eradication of ragweed near the city will be asked by the New Orleans Directorate of the American Hay Fever Association. The city ordinances concerning weeds, which have been enforced, have practically eliminated the spring epidemic. During the early fall the association made examinations of the air on windy days and much ragweed pollen was found, which was traced to its source outside the city.

East Baton Rouge Medical Society Meeting.—At the last meeing of the East Baton Rouge Medical Society, the following officers were elected: President, Dr. W. S. Cushman, Baton

Rouge; vice-president, Montgomery Williams, Denham Springs; secretary-treasurer, John McKowen, Baton Rouge; delegate to the society, T. S. Jones, Baton Rouge; alternate, E. B. Young, Baker; delegate to the state society, Chas. Duchien, Baton Rouge; alternate, Geo. M. Sitman, Burtville.

ARMY MEDICAL RESEARCH.—Authority has been given by the Secretary of War for the establishment of a research division under the surgeon general of the Army. This is intended for laboratory work, the main function being the investigation into causes of disease and methods of control. Some 25 medical officers will furnish the personnel for the laboratory work, and these officers will constitute an independent foreign roster separate from the general roster pertaining to assignment to duty beyond continental limits. By this means the transfer of these research officers will be confined to that list; when an officer on duty in Washington is due for foreign service he will be detailed to duty at one of the laboratories abroad, his place at home being taken by an officer of the same class on foreign station who is due to return. These laboratories will be located at general hospitals and department hospitals, in addition to which there will be department laboratories. The laboratory in Washington will be established at the Army Medical School and will serve as the laboratory for the Eastern Department. The other laboratories will be established at Fort Leavenworth, San Francisco, Fort Bayard, Honolulu, Manila, San Juan, and, possibly, in Alaska.—*Army and Navy Register.*

HEROIN OF NO VALUE.—At a recent meeting of the Committee on Drug Addiction of the Committee on Social Hygiene of the National Committee on Prisons, it was regularly moved by Dr. Frederick Peterson and seconded by Dr. Samuel W. Lambert that it be resolved that in the opinion of the committee, the drug heroin is of no real value in the practice of medicine and that its place may be better taken by more efficacious agents that do not menace public welfare.

Resolved, That the committee recommend federal legislation to prevent the importation, manufacture and sale of heroin in the United States.

LIBRARY AND MUSEUM FOR DENTAL INFIRMARY.—The Forsyth Dental Infirmary for Children (Boston) recently inaugurated a new department, to be known as the Library and Museum, the purpose of which is to preserve the results of experiments and discoveries which are daily being made at the institution. The infirmary asks for any suggestions which will be gratefully received, and will gladly furnish any information.

SEVERS CONNECTION WITH JOURNAL.—Dr. Philip Skrainka, formerly literary editor of the *Interstate Medical Journal*, has severed his connection with that journal and intends to start a new monthly medical journal in February, 1917, the name of which will probably be *Medicine and Surgery*. This journal as regards its literary contents will be of the first order, and the advertising pages will contain only ethical matter. Drs. Rudolph Matas and Isadore Dyer, of New Orleans, are included in the list of collaborators.

NEW SERVICE AT BELLEVUE HOSPITAL.—An Ophthalmological Service has been added to the other departments at Bellevue Hospital, New York. The service is in charge of Dr. Charles H. May, attending surgeon, who will have as his principal assistants Drs. Julius Wolff and John M. Wheeler.

THE TRI-STATE MEDICAL SOCIETY OF ARKANSAS-LOUISIANA-TEXAS held its thirteenth annual meeting in Texarkana on December 19 and 20, 1916 with about 100 doctors in attendance. The following officers were elected for the ensuing year: president, Dr. J. M. Bodenheimer, Shreveport, La.; vice-presidents, Dr. T. F. Kittrell, Texarkana, Ark.; Dr. T. E. Wright, Monroe, La.; Dr. C. M. Rosser, Dallas, Texas; secretary-treasurer, Dr. E. L. Beck, Texarkana, Ark.; councillors, Dr. L. H. Lanier, Texarkana, Ark.; Dr. Oscar Dowling, Shreveport, La., and Dr. Nettie Klein, Texarkana, Texas. Shreveport was elected as the meeting place for 1917.

HENRY S. WELLCOME PRIZES AWARDED.—The Association of Military Surgeons of the United States announces the results in the Henry S. Wellcome prize competition: Capt. Mahlon Ashford was awarded a gold medal and three hundred dollars. First Lieut. Henry C. Coe, M. R. C., of New York City, who received the honorable mention for this prize was awarded a

life membership in the association. A silver medal and two hundred dollars were awarded to Assistant Surgeon General W. C. Rucker, U. S. P. H. S., and to Passed Assistant Surgeon J. R. Burley, U. S. P. H. S., honorable mention for this prize and a life membership. These prizes, which are annually given by Mr. Henry Wellcome, an American living in London, are annually competed for by officers of the Army, Navy, Public Health Service, the National Guard and the Officers' Reserve Corps of both the Army and the Navy.

FISKE FUND PRIZE COMPETITION.—A prize has been ocered by the Fiske Fund trustees of $200 for the best essay submitted before May 1, 1917, on the "Role of Teeth and Tonsils in the Causation of Arthritis." Address Dr. Halsey De Wolf, 305 Brook Street, Providence, R. I., for further information.

SYMPOSIUM ON THE MEDICAL PROFESSION.—The January number of the *Medical Review of Reviews* at some length records what "sixty-six well-known voices, commingling in praise and blame" think of the medical profession. These different points of view of "what other people think of us" are quite interesting and enlightening.

HUMAN EASE A FRAUD.—The Human Ease Medicine Company, of Atlanta, Ga., has been issued a fraud order by the federal authorities denying them the use of the mails. Human Ease was guaranteed to "cure all diseases both in and on man and beast." On analysis the ointment was found to be composed of lard with a little sodium bicarbonate, sodium sulphate and potassium nitrate, flavored with oil of sassafras.

CANCER NOT HEREDITARY.—The annual meeting of the American Association of Life Insurance Presidents was held in New York City on December 15. In a paper on heredity of cancer based on a two-year' study of original insurance statistics bearing on the eighty thousand annual deaths from this disease in the United States, Mr. Arthur Hunter, president of the Actuarial Society, says: "There seems little to support the view that cancer is the result of contagion. Twenty thousand applications for insurances were reviewed and it was found that in 488 cases one only of the parents of the applicant was stated to have died from cancer and in four cases both parents were

stated to have died of that disease. There were 122 times as many cases in which one parent had died of cancer as those in which both parents had died of that disease. There could hardly be a stronger test than in the case of husband and wife. Men and women who are in anxiety of mind on account of the appearance of cancer in their ancestry or immediate family may dismiss such anxieties, as there is no statistical evidence at the present time that the disease of cancer is transmitted by inheritance in mankind."

PERSONALS.—Dr. P. L. Querens, a graduate of Tulane, has successfully passed the Cuban Medical Board of Examiners. Dr. Querens is located in Preston, Cuba, making a special study of tropical diseases, and expects to return to New Orleans in about a year.

Dr. Augustus McShane, for many years an eye, ear, nose and throat specialist of New Orleans, is now located in Greenwood, Miss., engaged in the same practice.

Dr. B. H. Palmer, a recent graduate of Tulane Medical College, has opened offices and laboratory in Tampa, Fla.

New State Board of Health appointments were announced too late for comment this month.

REMOVALS:

Dr. E. A. Carlisle, from Kingston to East Point, La.

Dr. C. E. Verdier, from 1209 to 1216 Maison Blanche Bldg.

Dr. B. H. Palmer, 10-11 First National Bank Bldg., Tampa, Fla.

DIED:

On December 16, 1916, at New Iberia, La., Dr. Jilson Payne Harrison, of Hammond, La.

On January 12, 1917, Dr. Michel Thomas Lanaux, well-known young specialist of New Orleans, aged 33 years. Dr. Lanaux's death was most untimely, and it is regretted by a large circle of friends and relatives.

BOOK REVIEWS AND NOTICES

All new publications sent to the JOURNAL will be appreciated and will invariably be promptly acknowledged under the heading of "Publications Received." While it will be the aim of the JOURNAL to review as many of the works accepted as possible, the editors will be guided by the space available and the merit of respective publications. The acceptance of a book implies no obligation to review.

A Text-book of Histology, by Frederick R. Bailey, fifth edition. William Wood and Co., New York, 1916.

This new edition of Bailey's Histology professes to have been thoroughly revised and parts of it rewritten. The unexpectedly slight evidence of either having been done has resulted in the addition of 8 pages and 8 figures beyond the totals contained in the fourth edition. Like the fourth, this edition is bound neatly and printed on pages of beautifully white, thick paper.

Also, as with the fourth edition, the part dealing with Microscopic Organology is relatively much more full and complete and indicates a much better grasp of the subject matter than the chapters dealing with Histology proper. Of the total text pages devoted to Organology, considerably more than one-third are given to the Nervous System and Sense Organs. In quality as well as in fullness, this part on the nervous system is the best in the book. For it, thanks are given Dr. O. O. Strong. It is untouched in the revision.

Fifty or more of the total pages of the book are sacrificed, in three special chapters and in paragraphs of the actual text-pages, to re-agents and methods for obtaining and preparing specimens for study. While this subject is of course important, with the modern curriculum and the methods in which the subjects are now usually presented, especially in medical schools, it is quite doubtful whether much space devoted to technic is as valuable as it would be were the book correspondingly enlarged by the pages being devoted instead to the actual subject matter. In practically all schools of higher rank, the preparations for the students to study are made by a trained technician, giving abundant preparations of uniform excellence throughout a class which has no time for the making of poorer and un-uniform preparations.

In the chapters devoted to Histology, those on muscular and nervous tissues are the best. However, the neuroglia is still described with the nervous tissues when it should be

with the fibrous connective tissues, while B, of figure 90 does not represent neuroglia at all, and figure 76 is quite incorrect as to the form and relations of neurofibrils.

Among other discrepancies, the following may be noted: Muscle and bone are discussed both as varieties of tissue and also each in a separate chapter as an Organ System. This seems hardly necessary with limited space, when each of the chapters is devoted as well to their descriptions as tissues, and when neither chapter is comprehensive of its title. In addition, under bone ("The Skeletal System") is discussed bone marrow which is a hemopoietic organ. The skeletal muscles only and the bones and some cartilages might be described together as a locomotor system of organs, space permitting. Other muscle belongs to the organs of which it forms a component. The important subject of blood is not given the attention it demands and the description of white blood corpuscles especially is surprisingly unsatisfying. The prevalence, extent, and significance of syncytia do not seem to be realized, and the distinction between cell and the syncytium and its derivatives is not definitely emphasized. Extents between the contraction-bands of cardiac muscle fibers are confused with cells, and the abundance, distribution and significance of the (interstitial) granules in the sarcoplasm of striated muscle is not realized. Bundles of fibers of white fibrous connective tissues are referred to as fibers. The hyaline cartilage matrix immediately bounding the lacunæ in elastic fibrous cartilage is not noted. "Mesothelium" and "Endothelium" are placed together as a separate class of epithelium when, histologically and by definition, both are varieties of simple squamous epithelium; and transitional epithelium is confused under the class, stratified columanar.

As a whole, the selection of the illustrations from the various sources is very good and the predominating better qualities of the text render the book quite usable.

Irving Hardesty.

The Treatment of Diabetes Mellitus With Observations Upon the Disease Based Upon One Thousand Cases. By Elliott P. Joslin, M. D.,

Dr. Joslin's book is a storehouse of valuable information and helpful suggestions. First he has kept the aim to let his experience of eighteen years be of practical assistance to the general practitioner and to the diabetic patient. But practical as the book is, it is the spirit of the scientific investigator that dominates it. Dr. Joslin's studies in conjunction with Professor Benedict at the Carnegie Nutrition Labora-

tory permit him to write with authority upon many phases of the abnormal physiology of the disease.

Dr. Joslin has focussed the point of his book upon the Allen treatment and when he speaks with so much emphasis and conviction, the profession may well listen with respect. "I would not have wished to write a book on diabetes three years ago; today it is a pleasure and an inspiration because the improvement in treatment is beyond question. The introduction of fasting and the emphasis on physical exercise in the treatment of diabetes by Dr. F. M. Allen of the Rockefeller Institute, has decidedly changed the outlook for this class of patients." Joslin's attitude with regard to the use of alkalis to combat acidosis is worthy of comment. He says: "A diabetic patient undoubtedly needs alkalis but one must bear in mind that it is possible that the administration of small quantities of an alkali over long periods may set free acid bodies existing combined, quiescent and harmless in the body, and thus do harm." Besides it may cause nausea and vomiting and "may deplete the body salts, such as chlorides which are distinctly useful." He thinks if alkalis are to be used it should be for a few days only and in severe cases of acidosis. The reviewer would add that during the past six months he has followed Dr. Joslin's advice and has had no occasion to regret it; he has felt forced to use soda bicarbonate in but one case, in the presence of evidence of impending coma.

A review of the book would be incomplete without a reference to the excellent section upon clinical laboratory methods and the section upon "Aids in the Practical Management of Diabetic Cases." The latter includes a chapter upon "What Every Diabetic Should Know" and upon "Directions for Nurses in Charge of Diabetic Patients," both of which should be reprinted in pamphlet form for patients and nurses. Dr. Joslin rightfully stresses the importance of educating the diabetic patient and of hospital treatment in that it affords the patient the opportunity of taking a course in diabetes.

Dr. Joslin's book is not only an interesting reference book; it is worthy of real study from cover to cover.

I. I. Lemann.

Christianity and Sex Problems, by Hugh Northcote, M. A. Second Edition, F. A. Davis Company, Philadelphia.

Sex problems have not yet reached the laboratory of present day medical investigation. The borderland topics of eugenics and of public morality are on the verge of consideration, because of the all pervading morbid influences of

the venereal diseases which are held to account for so many derelicts in modern civilized communities.

The accumulation of academic material, however, can only make the way easier later on and the book in review will help some. The medical man seldom views even morbid sex conditions from any but the physical side, but he may come to agree with the author in the main argument that an early morality derived from the teachings of Christian doctrine may safeguard many from the disasters of illicit sex congress.

"Science of sex is positively necessary," says the author, "to the understanding and appreciation of Christian sexual ethics. At present there is too much uncertainty in men's minds about the ethical ideals of sex."

If we are to be influenced by Freud's broad co-ordination of sex impulse in the expression of life's effort, then the field of practical medicine must concede the value and importance of a "science of sex." None of the medieval philosophers sidestepped such influence and perhaps when the materialistic blanket, which today veils the mental environment of most men, has been removed, ethics may once more have place. Just now the world seems hardly ready to engage any problem with a Christian basis.

The book is profoundly worth while and deserves the attention of the physician who may have his own or another's children to think for.

Dyer.

Practical Massage and Corrective Exercises, by Hartvic Nissen. F. A. Davis Co., Philadelphia.

This is a larger and revised arrangement of the Author's "Practical Massage in Twenty Lessons," now presenting the author's experience of a number of years in the field upon which he writes. The book is thoroughly practical and free of any pretense to anything else than the title embodies. We concur heartily with the author in the opinion that the neglect of massage and medical gymnastics on the part of the physician has encouraged a large growth of pretentious quacks in a field which does actually possess many virtues deserving the attention of every medical man.

The illustrations used to demonstrate the text are apt and well arranged; those showing the manipulation in massage seem to be from old plates and should be freshened in another edition.

Any practical text on this subject is worth while and one as simple as this should be in the hands of all physicians.

Dyer.

Infections of the Hand, by Allen B. Kanavel, M. D., 3rd Edition. Lea & Febiger, Philadelphia and New York.

This monograph is still a valuable contribution to surgical technics and deserving of careful reading to gather the estimate of its merits and usefulness. Aside from the co-ordination of the special surgical conditions of infectious origin which may affect the hand, there is large space devoted to the surgical anatomy of the hand as arguing the importance of relations in the treatment of the conditions of infection occurring on the hand. The strong personal equation evident throughout the book, stamps the work as the product of its author, who has labored well.

Dyer.

The Treatment of Infantile Paralysis, by Robert W. Lovett, M. D., P. Blakiston's Son & Co., Philadelphia.

After an introductory chapter covering the pathology, types and symptoms of infantile paralysis, the author takes up the treatment, dividing the subject into several sections, dealing with the acute phase, the convalescent stage, the chronic phase, etc. In each the detail of treatment is thorough and presented with frequent cuts to illustrate mechanical methods to be practised—when indicated.

Rest until tenderness is gone in the acute stage; avoid all therapy in the acute phase and use warm baths in the later part of this stage; prevention of contractions—these are axiomatic with the author and indicate the style of the book.

Dyer.

The Practical Medicine Series. Volume IV: **Gynecology.** Edited by Emilius C. Dudley, A. M., M. D., and Herbert M. Stowe, M. D. The Year Book Publishers, Chicago, 1916.

The Practical Medicine Series no longer needs an introduction to the medical profession of America. The Year Book Publishers were fortunate in the selection of a staff of editors who appreciate the new and the practical in the medical literature of the day and the busy practitioner can resort to these volumes with the assurance that he will find not only the original matter condensed into readable abstracts, but additional comments by the editors, a feature that adds no little to their value.

The same arrangement has been followed as in previous volumes and while the editors lament the dearth of foreign contributions, the subject matter gleaned largely from American literature appears to compare favorably with former editions.

Miller.

PUBLICATIONS RECEIVED

WILLIAM WOOD & COMPANY. New York, 1916.

Animal Parasites of Man, by H. B. Fantham, M. A., D. Sc., J. W. W. Stephens, M. D., D. P. H., and F. V. Theobald, M. A., F. E. S., F. R. H. S.

Gunshot Injuries, by Colonel Louis A. LaGarde. Second, revised edition.

W. M. LEONARD. Boston, 1916.

Principles of Medical Treatment, by George Cheever Shattuck, M. D. Third edition, revised and enlarged.

LEA & FEBIGER. New York and Philadelphia, 1916.

Progressive Medicine. Edited by Hobart Amory Hare, M. D., assisted by Leighton F. Appleman, M. D. December 1, 1916.

J. B. LIPPINCOTT COMPANY. Philadelphia and London, 1916.

International Clinics. Volume IV. Twenty-sixth Series, 1916.

THE YEAR-BOOK PUBLISHERS. Chicago, 1916.

The Practical Medicine Series. Volume VII: **Obstetrics;** Volume VIII, **Materia Medica and Therapeutics and Preventive Medicine.**

W. B. SAUNDERS COMPANY. Philadelphia and London, 1916.

The Clinics of John B. Murphy, M. D. December, 1916.

MISCELLANEOUS:

Monthly Bulletin of the Louisiana State Board of Health. New Orleans, December, 1916.

The Public Health Committee of the New York Academy of Medicine. 1911-1916. (17 West 43rd Street, New York City).

The Philanthropic Boards Established by John D. Rockefeller. (New York, 1916).

Carbon Dioxide Solidified. (Alda Manufacturing Co., Chicago).

REPRINTS:

Sex Mutilations; Sex Gland Implantation, by G. Frank Lydston, M. D.

The Use of Oxygen in Cystography, With a Preliminary Report on the Use of Oxygen in Pyelography, by Amedee Granger, M. D.

New Ranges for Old Plants, by Oliver Atkins Farwell.

MORTUARY REPORT OF NEW ORLEANS.

Computed from the Monthly Report of the Board of Health of the City of New Orleans, for December, 1916.

Cause.	White	Colored	Total
Typhoid Fever	4	2	6
Intermittent Fever (Malarial Cachexia)	1	.....	1
Smallpox	.....	.....	.....
Measles	4	3	7
Scarlet Fever	.....	.....	.....
Whooping Cough	2	1	3
Diphtheria and Croup	3	1	4
Influenza	10	5	15
Cholera Nostras	.....	.....	.....
Pyemia and Septicemia	.....	.....	.....
Tuberculosis	48	53	101
Cancer	28	7	35
Rheumatism and Gout	1	3	4
Diabetes	10	1	11
Alcoholism	4	.....	4
Encephalitis and Meningitis	.....	1	1
Locomotor Ataxia	1	1	2
Congestion, Hemorrhage and Softening of Brain	15	11	26
Paralysis	6	2	8
Convulsions of Infancy	.....	.....	.....
Other Diseases of Infancy	9	9	18
Tetanus	.....	.....	.....
Other Nervous Diseases	1	1	2
Heart Diseases	84	41	125
Bronchitis	6	1	7
Pneumonia and Broncho-Pneumonia	33	35	68
Other Respiratory Diseases	3	1	4
Ulcer of Stomach	2	1	3
Other Diseases of the Stomach	4	2	6
Diarrhea, Dysentery and Enteritis	17	21	38
Hernia, Intestinal Obstruction	1	1	2
Cirrhosis of Liver	9	3	12
Other Diseases of the Liver	2	1	3
Simple Peritonitis	.....	.....	.....
Appendicitis	4	1	5
Bright's Disease	26	21	47
Other Genito-Urinary Diseases	8	9	17
Puerperal Diseases	7	1	8
Senile Debility	2	1	3
Suicide	5	.....	5
Injuries	20	14	34
All Other Causes	11	14	25
Total	391	269	660

Still-born Children—White, 20; colored, 17; total, 37.

Population of City (estimated)—White, 276,000; colored, 102,000; total, 378,000.

Death Rate per 1,000 per annum for Month—White, 16.99; colored, 31.65; total, 20.95. Non-residents excluded, 18.79.

METEOROLOGIC SUMMARY. (U. S. Weather Bureau.)

Mean atmospheric pressure 30.06
Mean temperature ..... 57.
Total precipitation ..... 7.17 inches
Prevailing direction of wind, southeast.